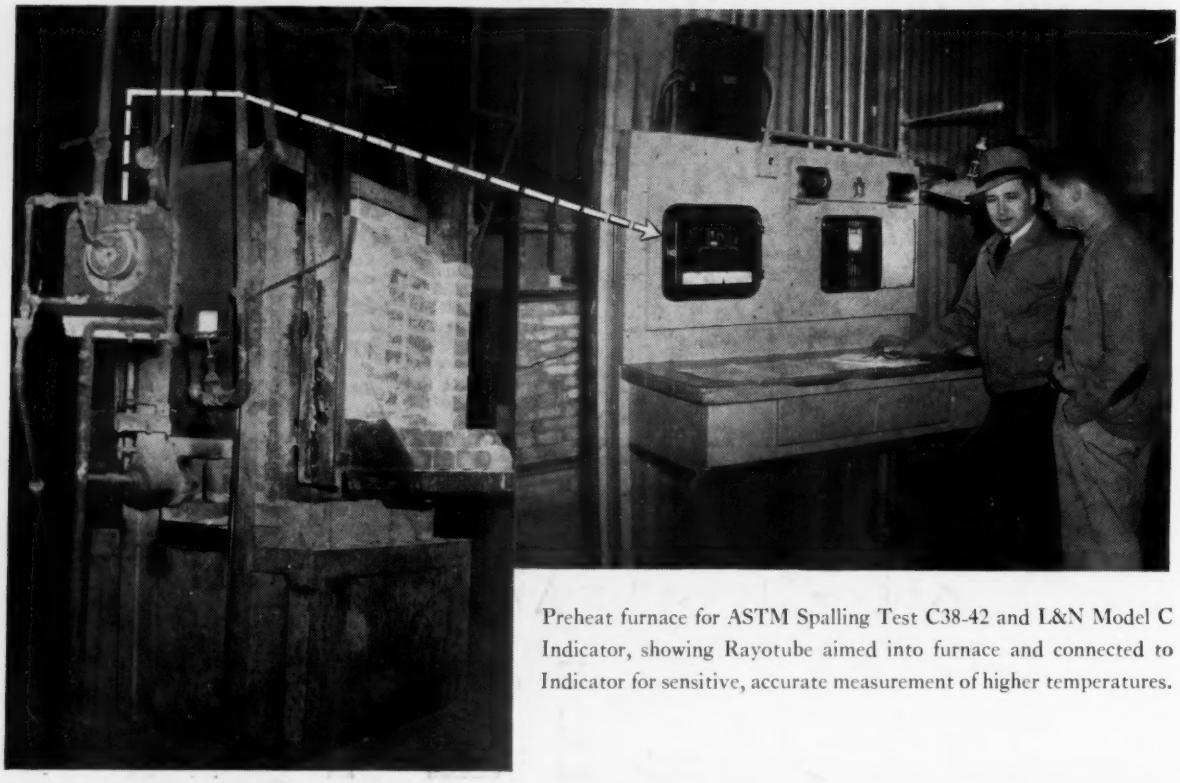
CERAMIC ABSTRACTS and THE BULLETIN

OF THE

AMERICAN CERAMIC SOCIETY

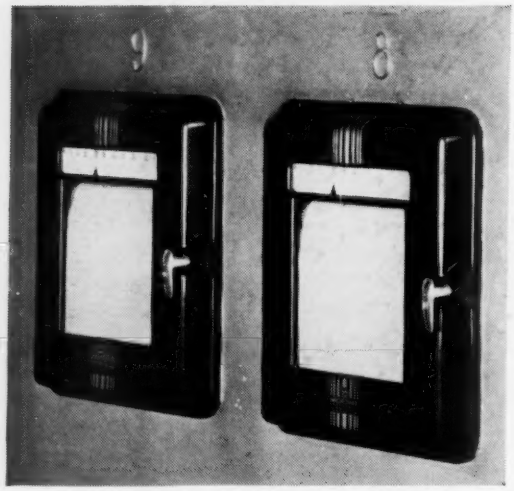
AUGUST 15, 1945

MONTHLY PUBLICATION DEVOTED TO THE ARTS AND SCIENCES RELATED TO THE SILICATE INDUSTRIES



Preheat furnace for ASTM Spalling Test C38-42 and L&N Model C Indicator, showing Rayotube aimed into furnace and connected to Indicator for sensitive, accurate measurement of higher temperatures.

When RADIATION is measured A.P. Green uses RAYOTUBE



Micromax Recording Controllers being used in a Maryland plant with Rayotubes for micro-responsive, automatic regulation.

Shown here is a typical part of the complete equipment used by A. P. Green Fire Brick Co., Mexico, Mo., in applying ASTM Spalling Test C38-42 to their products. The Control Panel has both Micromax Automatic Temperature Indicator and an L&N Manual Indicator, and is used in all testing department work.

This furnace is equipped with both a thermocouple and a Rayotube radiation-detector. Heating starts with the couple in use. The Rayotube, however, is aimed at the panel of test brick which forms one wall of the furnace, and when this wall becomes hot enough the Rayotube Micromax Pyrometer takes over. Changes in temperature are reported with utmost promptness, and the operator is helped to hold the work far inside its temperature limits. An L&N Optical Pyrometer is used for the Optical Measurements specified by ASTM.

For Rayotube details, see Catalog N-33B.

Jrl Ad N-33(49b)

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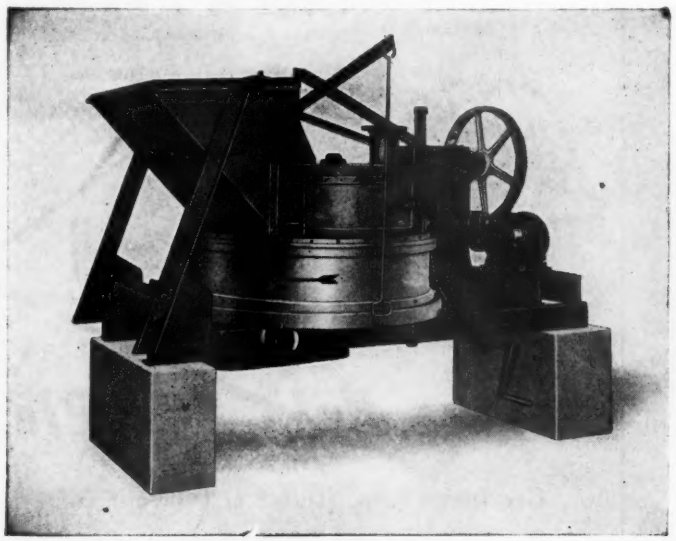

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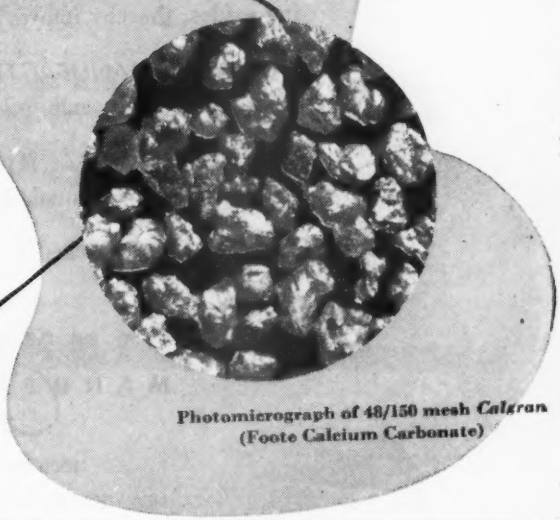

Photomicrograph of 48/150 mesh *Calgran* (Foote Calcium Carbonate)

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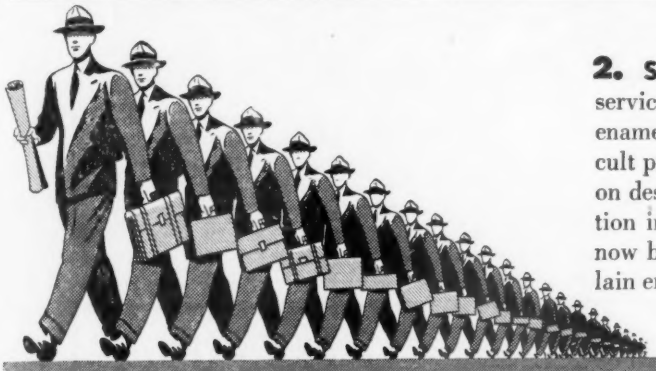

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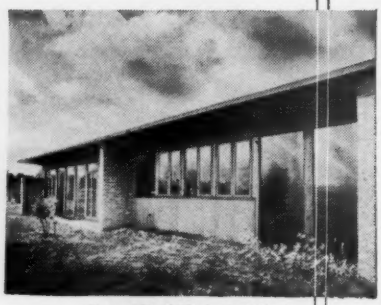
LOOK TO THE FUTURE *Thru Glass!*

tomorrow's glass homes will be solar heated



George Fred Keck, Architect

Progressive research and new manufacturing processes have given today's high grade glass amazing chemical and physical properties. New forms and types of high grade glass will build the myriads of solar-heated glass homes for postwar. Glass partitions and side walls will transmit heat from the sun and help "trap it" for utilization as central heating.

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NORTON COMPANY - Worcester 6, Mass.

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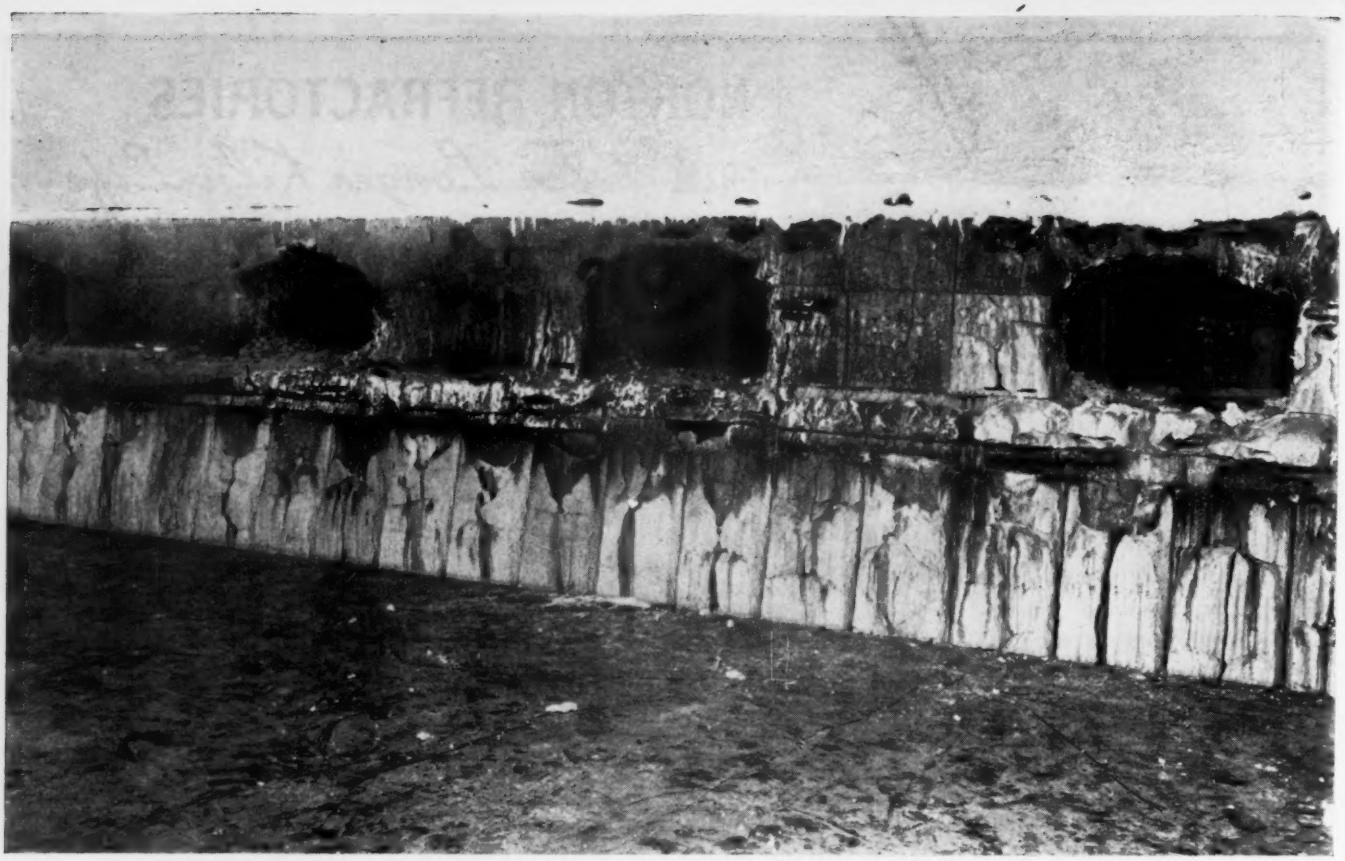

PROGRESS WITH CORHART

The Corhart* Electrocast balanced tank shown above recently completed its second Corhart campaign on flint bottle glass. During its first Corhart campaign, the tank contained Corhart Electrocast throughout the melting-end sidewalls, throat, dog-house, and in portions of both the superstructure and the melting-end bottom. . . . For the second campaign, the use of Corhart Electrocast was extended to include additional superstructure, and a larger portion of the melting-end bottom (as well as the entire refining-end sidewalls, and a portion of the refining-end bottom).

The following is the operating data for both campaigns. We believe you will agree that the increased production figures fully justify the description above—"*Progress* with Corhart."

	8/14/39 to 1/8/42	3/5/42 to 1/19/45	Percent of Increase
Melting Area	770.5	770.5	0.0%
Total Days Life	870	1,051	20.8%
Total Operating Days	803	1,018	26.8%
Total Tons Glass Produced	75,631	102,899	36.0%
Tons Glass Per Day (Life)	87	98	12.6%
Tons Glass Per Day (Operating)	94	101	7.4%
Tons Glass Per Sq. Ft. Per Life	98.15	133.54	36.0%

On the third Corhart rebuild of this tank, now completed, the use of improved Corhart Electrocast products was extended. Further progress is expected. Corhart Refractories Company, *Incorporated,* 16th and Lee Streets, Louisville 10, Kentucky.

*Not a product, but a registered trade-mark.

QUALITY ECONOMY ENDURANCE

CORHART ELECTROCAST REFRACTORIES

Ceramic Abstracts Section

Compiled by

THE AMERICAN CERAMIC SOCIETY

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Vol. 24 **August 15, 1945** **No. 8**

Abrasives

Comparison of surface roughness of finest worked plane surfaces. J. KLUGE AND G. BOCHMANN. *Z. Ver. deut. Ing.*, **88** [13/14] 179–81 (1944).—A surface-testing apparatus for determining whether a surface has the same roughness after repeated working is described. The instrument uses light that can be reflected in varying angles from 20° to 90°. The light hits the surface at a definite angle, and the amount of the reflected light is measured by a selenium cell. At an angle of incidence of 86°, it is possible to measure degrees of roughness corresponding to a profile height of 1 to 8 μ. M.HA.

Economic use of diamond abrasive grinding wheels. ANON. *Ind. Diamond Rev.*, **5** [54] 108–109 (1945); IDR Data Sheet and Pin-up Page No. 12.—The data sheet contains recommendations for the economic use of diamond grinding wheels, dealing with the use of resinoid-bonded diamond wheels, metal-bonded diamond wheels, wheels with diamond rolled into surfaces, and wheels with loosely applied diamond for the grinding and polishing of diamond itself, sintered carbide and hardened steel, sapphire, and metallographic specimens. Data are given on preparation as well as cleaning, lubricating, and reconditioning, on materials to be machined with diamond wheels, and on service data for diamond wheels (surface speed, grain size, purpose). 6 references. See *Ceram. Abs.*, **24** [1] 2 (1945). P.G.

Relative mechanical corrosion hardness of synthetic corundum. W. F. EPPLER. Abstracted translation in *Ind. Diamond Rev.*, **5** [55] 121–25 (1945); see *Ceram. Abs.*, **21** [2] 33 (1942). P.G.

Thread-grinding attachment for lathes. ANON. *Werkstattstech. u. Werksleiter*, **35**, 289–90 (1941); *Ind. Diamond Rev.*, **5** [55] 130 (1945).—Two thread-grinding attachments for lathes are described, one manufactured by H. Lindner and the other by Hahn & Kolb, Germany. The truing devices correspond to the particular application for which the attachment is used. 2 references. P.G.

[**Three novel wheel-truing devices.**] ANON. *Ind. Diamond Rev.*, **5** [54] 99, 104–105 (1945).—Two new radius truing devices are being manufactured by the U. S. Tool & Mfg. Co.; a hand-operated involute truing device is produced by the Fitchburg Grinding Machine Corp., and a form-truing attachment for centerless grinders for both grinding and regulating wheels has been developed by A. Scrivener, Ltd. All three devices are described in detail. 7 figs. P.G.

Truing devices for internal grinders. ANON. *Ind. Diamond Rev.*, **5** [55] 136 (1945).—Special truing devices used with the Keighley internal grinder are described: hydraulic truing device, angle-forming attachment, and combined side and diameter truing arrangements. They are manufactured by Keighley Grinders, Ltd. 4 photographs. P.G.

Wheel-truing mechanism for profile grinder. E. A. COOKE. *Ind. Diamond Rev.*, **5** [55] 132–33 (1945).—An ingenious wheel-truing mechanism used in the Taylor, Taylor & Hobson profile grinder is described in detail. It is based on the simple mechanical principle of the elliptical trammel. Optical equipment permits observation for correct adjustment of the diamond point. 3 references, 3 diagrams. P.G.

SEPARATE PUBLICATIONS

Abrasive Grain Sizes. ANON. *Nat. Bur. Standards, Simplified Practice Recommendation*, **R118-45**, 8 pp. (1945). Price 5¢ from Supt. of Documents, Washington, D. C.—Supersedes R118-40. The changes that have been effected by this revision concern two items in the table of grain sizes. Grit No. 46 has been changed to show an increase, from 20 to 30%, in allowable oversize and a reduction in the cumulative minimum from 75 to 65%, and grit No. 240 has been added. R.A.H.

PATENTS

Abrasive article. A. L. BALL, R. C. BENNER, AND R. L. MELTON (Carborundum Co.). Can. 426,359, March 27, 1945 (July 29, 1943). G.M.H.

Abrasive articles. UNITED STATES RUBBER CO. Brit. 569,076, May 16, 1945 (June 27, 1942).

Abrasive material. H. F. FRUTH (Galvin Mfg. Corp.). U. S. 2,378,399, June 19, 1945 (April 26, 1943). 4 claims. Cl. 51-164.5.—1. A preformed abrasive material comprising relatively large pieces of body material each provided with a substantially uninterrupted surface coating which includes a mixture of relatively fine abrasive powder

and a set bonding agent rigidly securing the powder particles to the surfaces of the pieces of body material.

Abrasive materials. A. A. KLOKH AND M. N. DUDAREV. Russ. 55,542, Aug. 31, 1939; abstracted in *Ind. Diamond Rev.*, **5** [54] 98 (1945).—In a method of producing abrasive material and articles by using quartz, silicon carbide, and pumice stone as abrasives and vulcanite as binder, to improve the effect of the dry cutting (grinding and polishing) of glass and molten quartz, silicon carbide and pumice stone are introduced into the mass in the weight ratio of 1:1:2 with allowable deviation of ±15%. P.G.

Abrasive and refractory material. H. N. BAUMANN, JR., AND R. C. BENNER (Carborundum Co.). Can. 427,016, April 24, 1945 (Jan. 4, 1941; in U. S. Jan. 8, 1940). G.M.H.

Abrasive wheels. TITAN ABRASIVES CO. Brit. 569,242, May 24, 1945 (Jan. 9, 1943).

Automatic abrading machine. G. A. CARLSON. U. S. 2,377,991, June 12, 1945 (Oct. 13, 1943). 13 claims. Cl. 51-131.

Automatic turret grinding or polishing machine. G. A. CARLSON. U. S. 2,377,992, June 12, 1945 (Oct. 14, 1943). 10 claims. Cl. 51-53.

Centrifugal abrasive-sheet holding wheel. R. S. GUTSELL. U. S. 2,377,880, June 12, 1945 (June 4, 1943). 10 claims. Cl. 51-191.

Cooling means for abrasive cutters. A. B. EASTWOOD (Tabor Mfg. Co.). U. S. 2,378,070, June 12, 1945 (Feb. 12, 1944). 4 claims. Cl. 51-267.

Devices for producing involute or modified involute tooth profiles on gear-grinding disks. A. AEPPLI. Brit. 569,081, May 16, 1945 (June 11, 1942).

Differential motions for traversing textile card-grinding rollers. S. W. DRONSFIELD AND DRONSFIELD BROS., LTD. Brit. 569,679, June 13, 1945 (Nov. 5, 1943).

Dressing mechanism. L. O. CARLSEN (Gleason Works). U. S. 2,378,980, June 26, 1945 (March 1, 1943). 26 claims. Cl. 125-11.—1. In a machine for grinding gears in a generating operation.

Grinding fixture for cutters. ARTHUR RINGZELLI. U. S. 2,379,594, July 3, 1945 (Jan. 29, 1943). 5 claims. Cl. 51-225.

Grinding machine. G. W. BINNS AND F. J. THELER (Cincinnati Milling Machine Co.). U. S. 2,377,921, June 12, 1945 (June 10, 1943). 21 claims. Cl. 51-74.—Ball grinder. W. G. BALDENHOFER (Thompson Grinder Co.). U. S. 2,378,903, June 26, 1945 (Sept. 19, 1941). 22 claims. Cl. 51-92. W. J. BRYANT (Bryant Chucking Grinder Co.). U. S. 2,378,127, June 12, 1945 (July 1, 1943). 6 claims. Cl. 51-105. R. H. CRAMER (General Motors Corp.). U. S. 2,379,281, June 26, 1945 (Oct. 22, 1942). 15 claims. Cl. 51-236.

Grinding-machine control. MARTIN DE YOUNG (Gallmeyer & Livingston Co.). U. S. 2,378,066, June 12, 1945 (May 1, 1944). 10 claims. Cl. 51-233.

Grinding machine and method of grinding. F. J. THELER, G. W. BINNS, AND JACOB DECKER (Cincinnati Milling Machine Co.). U. S. 2,377,982, June 12, 1945 (Dec. 24, 1942). 26 claims. Cl. 51-74.—Ball grinder.

Internal screw thread lapping machine. A. M. DRAKE (Niles-Bement-Pond Co.). U. S. 2,379,693, July 3, 1945 (April 19, 1943). 6 claims. Cl. 51-96.

Machines for grinding tooth flanks of gear wheels by means of profiled abrasive disks. A. AEPPLI. Brit. 569,082, May 16, 1945 (June 18, 1942).

Making abrasive articles. R. A. BAUMGARTNER (Carborundum Co.). U. S. 2,378,386, June 19, 1945 (June 28, 1944). 6 claims. Cl. 51-297.—1. Maintaining the outer layers of the superimposed sheet material being compressed in a humidified condition while subjecting the assembly of the superimposed sheet material to heat and pressure to form the desired shape.

Making an abrasive article. A. G. SCUTT (Carborundum Co.). U. S. 2,379,544, July 3, 1945 (June 24, 1943). 6 claims. Cl. 51-209.—1. The method of making bonded abrasive articles having rigid supporting elements adhesively attached thereto.

Method and apparatus for grinding and polishing wedges. H. L. PENBERTHY (Eastman Kodak Co.). U. S. 2,378,243, June 12, 1945 (Aug. 3, 1943). 17 claims. Cl. 51-283.

Polishing-wheel construction. G. S. FULLER. U. S. 2,379,141, June 26, 1945 (Sept. 29, 1944). 12 claims. Cl. 51-195.

Radius wheel dresser. ARTHUR GREIG (U. S. Tool and Mfg. Co.). U. S. 2,377,934, June 12, 1945 (July 29, 1944). 5 claims. Cl. 125-11.

Reinforced abrasive article mounted on a backing plate. W. M. WHEILDON, JR. (Norton Co.). U. S. 2,378,271, June 12, 1945 (July 1, 1943). 2 claims. Cl. 51-209.

Ring lapping machine. C. A. FULMER. U. S. 2,378,696, June 19, 1945 (May 2, 1944). 7 claims. Cl. 51-26.

Saw-grinding device. PAUL KIECHLE. U. S. 2,379,642, July 3, 1945 (Oct. 14, 1943). 4 claims. Cl. 76-41.

Sine plate angle wheel dresser. A. E. WISNE. U. S. 2,378,743, June 19, 1945 (Aug. 9, 1943). 5 claims. Cl. 125-11.

Single rail grinder. H. H. TALBOYS AND H. E. ERICKSON (Nordberg Mfg. Co.). U. S. 2,378,512, June 19, 1945 (Jan. 7, 1942). 23 claims. Cl. 51-178.

Spherical grinding apparatus. B. I. THOMPSON (Rotol, Ltd.). Can. 426,563, April 3, 1945 (Dec. 30, 1942; in Great Britain Nov. 3, 1941). G.M.H.

Vitrified grinding wheels. LORING COES, JR. (Norton Co.). U. S. 2,377,995, June 12, 1945 (Sept. 7, 1944). 6 claims. Cl. 51-295.—1. An abrasive article comprising abrasive grains bonded as a porous body by means of vitrified ceramic material and a filler incorporated in the pores comprising furfuryl alcohol polymerized with lignin.

Art and Archeology

Beauty from ashes. GORDON M. FORSYTH. *Pottery Gaz.*, **68** [793] 371–77 (1943).—F. traces the decline of English china from the world-famous ware of 1750–1800 to the debased mass-produced material resulting from Victorian expansion. He considers that we have lost in the modern industrial system many of the fine qualities of medieval craftsmanship. Even mass-produced ware should possess beauty. The great importance of research is emphasized, and suggestions are given, e.g., the possibility of hardening and perfecting earthenware and china bodies up to the quality and standard of hard porcelain and of extending the range of colors for underglaze lithography. He suggests research in art, more collaboration with other industries, and some form of censorship for suppressing bad design. L.C.C.

Color engineering. ANON. *Bull. Amer. Ceram. Soc.*, **24** [7] 265 (1945).

Designer and the American market. Tariff wall isn't all. VIRGINIA LIVINGSTON GRIMES. *Bull. Amer. Ceram. Soc.*, **24** [7] 251 (1945).

Layman looks at design. ANON. *Pottery Gaz.*, **70** [815] 259–61 (1945).—Views of a manufacturing potter are presented. L.C.C.

Role of designer. VINCENT BROOMHALL. *Bull. Amer. Ceram. Soc.*, **24** [7] 252 (1945).

Harold Stabler—a great designer of pottery. JOHN ADAMS. *Pottery Gaz.*, **70** [815] 275 (1945).—An account of the work of Harold Stabler and typical examples of his achievements are given. L.C.C.

Tile ovens: development and prospects. JULIUS VÖLSER. *Ber. Deut. Keram. Ges.*, **25** [3/4] 61–79 (1944).—The development of the Dutch tile oven from the earliest traceable beginnings to date is discussed. In its early forms it was a crude affair for the sole purpose of heating

the dwelling. The use of refractories and improved construction enabled the tile oven to act as heat storage. It gradually developed into a masterpiece of art. The Dutch tile oven became highly decorative without losing its heating qualities; indeed they were greatly perfected. From its height as a masterpiece, the tile oven was degraded into an unsightly, cheap, commercial product. The art and the skill of building tile ovens were almost completely abandoned but have recently been revived. Modern designs coupled with the use of recent technical developments in refractories and glazing will regain for the Dutch tile oven (and the fireplace) its rightful place—the hearth of the home. M.Ho.

PATENTS

Bathtub design. JACQUES STANITZ (Mullins Mfg. Corp.). U. S. 141,621, June 19, 1945 (March 26, 1945). Cl. D4-4.

Bottle design. BEATRICE CREAMERY CO. Can. 14,016, March 10, 1945. G.M.H.

Crystal novelty and paperweight. W. M. SNYDER (Sarah S. Snyder). Can. 426,157, March 13, 1945 (Sept. 13, 1944). G.M.H.

Design for combined lavatory and vanity. JACQUES STANITZ (Mullins Mfg. Corp.). U. S. 141,619 and 141,620, June 19, 1945 (March 26, 1945). Cl. D4-2.

Glass plate design, etc. C. L. FORDYCE (Pitman-Dreitzer & Co., Inc.). U. S. 141,680, June 26, 1945 (Jan. 1, 1945). Cl. D44-15.

Vase design. CHEERIO TOYS AND GAMES, LTD. Can. 14,031, April 5, 1945. G.M.H.

Vehicles for application of ceramic colors. A. J. DEYRUP (E. I. du Pont de Nemours & Co.). U. S. 2,379,507, July 3, 1945 (May 1, 1940). 15 claims. Cl. 260-16.—12. A ceramic composition comprising a vitrifiable glaze suspended in a medium comprising ethyl cellulose and a terpene solvent.

Cements

Grasby Limes, Ltd. ANON. *Cement, Lime and Gravel*, **19** [7] 223–27; [8] 263 (1945).—The layout of the $CaCO_3$ plant is given. L.C.C.

Setting and disintegration of cements. G. BATTA. *Bull. soc. chim. Belg.*, **53**, 1–25 (1944); abstracted in *Chem. Zentr.*, **1944, I** [21/22] 1211.—The behavior of Portland cement and sulfate-rich cement (essentially blast-furnace slag and gypsum) was investigated before and after setting under the action of aggressive waters, e.g., sea water, calcium sulfate, magnesium sulfate, and magnesium chloride, by determining, after the action, the alkalinity, pH value, sulfuric acid anhydride, lime, and magnesia. The good behavior of the sulfate-rich cement under the action of gypsum-containing water can by no means be ascribed to a resistivity in itself but can rather be explained by the formation of a protective skin which consists mainly of calcium carbonate. Portland cements, on the other hand, disintegrate, principally due to an action of the content of free lime. A formation of sulfoaluminate under the action of sulfate could not be established in the sulfate-rich cement. A classification of cements is apparently possible by determining the index *H* (lime in solution or lime having reacted ÷ by total lime × 100). See "Mechanism. . .," *Ceram. Abs.*, **23** [10] 166 (1944). M.HA.

PATENTS

Cement raw material processing. HANS GYGI. Can. 426,798, April 17, 1945 (July 29, 1942; in Switzerland March 13, 1942). G.M.H.

Manufacture of artificial pozzuolana of high mechanical and chemical resistance. SERAFINO MARSALA. Ital. 393,256, Sept. 9, 1941; abstracted in *Chem. Zentr.*, **1944, I** [21/22] 1214.—The mass is made of sand, alumina, magnetite, MgO, TiO_2, and CaO as such or also as clay. The powdered mixture is heated for 24 hr. to 900°C. M.HA.

Manufacture of Portland cement containing lime only in the bound state and free of tricalcium aluminate. FABIO FERRARI. Ital. 393,642, May 17, 1941; abstracted in *Chem. Zentr.*, **1944, I** [21/22] 1214.—The tricalcium-aluminate should be present in the form of tetracalcium ferrialuminate (**I**) in a quantity of 10 to 40%. An example is the composition 35.33 tricalcium silicate, 41.57 dicalcium silicate, 22.20 **I**, and 0.90% miscellaneous. M.HA.

Silicate cement, particularly useful as a coating. C. L. JEWETT (Minnesota Mining & Mfg. Co.). U. S. 2,378,927, June 26, 1945 (Oct. 4, 1938; Sept. 13, 1941). 5 claims. Cl. 106-74.—1. As a new article of manufacture, a dense lithic base granule coated by producing *in situ* thereon the unfused, solid phase heat-reaction product of an aqueous solution of sodium silicate of concentration approximately 30 to 38% and an admixed solid fluoride, the fluoride being a ternary compound of fluorine, an alkali metal, and a polyvalent metal, the sodium silicate containing at least one molecular proportion of sodium oxide to 3.25 molecular proportions of silicon dioxide and the fluoride being present in at least the amount adequate theoretically to neutralize the silicate, the heat-reaction product being produced at elevated temperatures substantially in excess of atmospheric and room temperatures but below those temperatures which would produce fusion, and the heat-reaction product having a coloring agent therein.

Enamel

Applications of titanium oxide in vitreous enamels. S. G. TINSLEY. *Ann. Proc. Inst. Vitreous Enamellers*, **7**, 99–128 (1941–1942).—The occurrence, manufacture, and properties of TiO_2 are described, and its use in acid-resisting enamel is discussed. The theory of opacification and the effect of batch ingredients with typical batch formulas are given, together with the effect of suspending agents and color improvers. Discussion. See "Titanium . . .," *Ceram. Abs.*, **21** [6] 120 (1942). A.J.B.

Developments in vitreous enameling. J. W. BAILEY. *Ann. Proc. Inst. Vitreous Enamellers*, **7**, 148–63 (1941–1942); see *Ceram. Abs.*, **21** [9] 185 (1942). A.J.B.

Effect of ground coats on reflectance of cover enamels. P. C. STUFFT AND G. H. SPENCER-STRONG. *Jour. Amer. Ceram. Soc.*, **28** [7] 183–88 (1945).—2 references, 10 figures.

Impact test for vitreous enameled metal. ANON. *Ann. Proc. Inst. Vitreous Enamellers*, **7**, 74–77 (1941–1942).—Report of the Joint Committee on Vitreous Enamelling. A falling-weight type of apparatus for testing the resistance to impact of enameled sheets is recommended. The sheet may be clamped in position over a solid or hollow anvil. The weight is a 0.5-in. diameter ball in a cylindrical holder weighing 150 gm. and falling 5 to 120 cm. A.J.B.

Milling of enamels. A. BIDDULPH. Read before the Institute of Vitreous Enamellers, Nov., 1944; abstracted in *Bull. Brit. Cast Iron Research Assn.*, **7** [12] 256 (1945). M.HA.

Observations on cast-iron enameling. A. BIDDULPH. *Ann. Proc. Inst. Vitreous Enamellers*, **7**, 78–98 (1941–1942); see "Cast-iron . . .," *Ceram. Abs.*, **22** [2] 28 (1943). A.J.B.

Properties of enamel opacifiers. G. T. O. MARTIN. *Ann. Proc. Inst. Vitreous Enamellers*, **7**, 129–46 (1941–1942).—M. examines the theory of opacity with reference to color and particle-size distribution. He describes a method of testing the latter in samples of commercial opacifiers and gives the results and a discussion of their significance. A.J.B.

Recommended method of testing the acid resistance of finished enamelware. ANON. *Ann. Proc. Inst. Vitreous Enamellers*, **7**, 14–39 (1941–1942).—The previously recommended test for acid resistance is not applicable to finished ware. The principle of the new test is based on the filter-paper spot test with some refinements and a new method of interpreting results. Acid solution is left in contact with the clean flat surface for a given time, and the treated surface is tested for its ability to retain finely divided dry materials of contrasting color. Solutions used are (1) 15% HCl, (2) 10% citric acid (by weight), and (3) 2% acetic acid (by volume of glacial acetic acid). After 15 min., the solution is washed off, and the surface is dried. Precipitated oxide is rubbed onto the dry enamel surface with dry chamois leather. There should be no uniform color stain over the acid-treated portion of the surface. Enamel surfaces are graded as (*a*) unaffected by all solutions, (*b*) affected by solution 1 but not by 2 or 3, (*c*) affected by 1 and 2 but not by 3, and (*d*) affected by all three solutions. These gradings correspond approximately as follows to the figures given by the previous bowl test: *a* 0 to 40, *b* 40 to 200, *c* 200 to 400, and *d* over 400 mg. per sq. dm. A full description of work done in the development of the tests and reasons for the final adoption of this method are given. Criticisms of the bowl test are discussed. A.J.B.

Report of Enamel Division Standards Committee. R. L. COOK, Chairman. *Bull. Amer. Ceram. Soc.*, **24** [7] 264–65 (1945).

Surface treatment and enamel adherence. ANON. *Ann. Proc. Inst. Vitreous Enamellers*, **7**, 40–73 (1941–1942).—A comprehensive account is given of an investigation of the effect of the pickling process on the adherence of sheet steel ground coat with reference to the use of inhibitors, electrolytic and sulfide pickling, and the use of the nickel dip. Previous work on the theory of adherence is reviewed, and experimental methods, with the results obtained, are described. The relationship of the methods of test to field experience is shown. Conclusions show that the impact test gives a measure of the adherence of the ground coat when the reverse side of the plate is observed, but results are not dependable with a cover coat. Adherence depends on surface roughness, which is limited by the use of inhibitors. With ingot iron sheet, inhibitors may be used in hot sulfuric acid but not in cold hydrochloric acid. Enamel adherence is reduced when inhibitors are used. Sandblasting gives good adherence but leads to other difficulties. Electrolytic pickling has little advantage, but sulfide pickling with sulfuric acid shows a good degree of adherence not found with the process in HCl. Nickel dip does not improve adherence where this is already good, although it improves latitude in fusing conditions. A.J.B.

Use of vitreous enamel for protecting antiglare sheeting. J. C. HUDSON. Abstracted in *Ann. Proc. Inst. Vitreous Enamellers*, **7**, 147 (1941–1942).—H. describes an investigation of protective coatings for antiglare sheeting, which is often exposed to highly corrosive combinations of sulfur gases, steam, and high temperature, particularly in coke ovens, cupolas, pig beds, and similar equipment. Numerous coatings were tested, of which vitreous enamel proved most resistant at highest temperatures. Discussion. A.J.B.

PATENTS

Enamel composition. J. W. GARRISON (General Electric Co.). U. S. 2,379,075, June 26, 1945 (May 20, 1941). 2 claims. Cl. 106-48.—1. A zinc borosilicate enamel composition comprising boric oxide and silica in an amount equal to approximately 50% by weight of the total composition and zinc oxide in an amount at least about equal by weight to that of any other single constituent, the boric oxide, silica, and zinc oxide constituting approximately 75% by weight of the total composition, the composition further containing the oxides of aluminum, cadmium, and barium in a total amount of approximately 10 to 15% and approximately 8 to 15% of alkali oxides.

Manufacture of enamel free of or low in boron. SCHULTHEIS & SÖHNE CHEMISCH-KERAMISCHE FABRIK. Fr. 881,587, April 29, 1943 (April 28, 1942); abstracted in *Chem. Zentr.*, **1944, I** [21/22] 1213.—The boron compounds are replaced entirely or in part by sulfur and sulfur compounds whereby, in applying the enamel to the iron, the formation of iron carbide (Fe_3C), which causes black dots or little blisters in the enamel, is avoided. The sulfur in the enamel mass reacts with the carbide according to $Fe_3C + 3S + O_2 = 3FeS + CO_2$, or it forms polysulfides or, in the presence of SiO_2, sulfated polysilicates according to $Fe_3C + 3FeS + 3Na_2O + 18SiO_2 + 5O = 3FeSi_2O_4S + 3Na_2FeSi_4O_{10} + CO_2$. M.HA.

Manufacture of ZnO-free white enamel by the use of gaseous opacifiers. VEREINIGTE CHEMISCHE FABRIKEN KREIDL, HELLER & Co. N.F.G. Dutch 53,724, Jan. 15, 1943 (April 4, 1939); *cf.* Ger. 721,491; abstracted in *Chem. Zentr.*, **1944, I** [21/22] 1213.—ZnO is replaced by F-containing materials, e.g., Na_2SiF_6, fluorspar, natural or synthetic cryolite, AlF_3, and NaF; eventually the alkaline earths can also be replaced in a similar manner. An example for an enamel is given: 20.2 borax, 17.4 feldspar, 32.6 quartz, 9.6 boric acid, 3.0 $NaNO_3$, 6.0 Na_2SiF_6, and 2.0 kg. cryolite. After cooling, the melt is ground in the mill after the gaseous opacifier has been added. M.HA.

Porcelain enameled panel mounting. W. A. BARROWS. U. S. 2,379,269, June 26, 1945 (Sept. 25, 1943). 10 claims. Cl. 189-88.

Glass

British table glass—its war work and the future. ANON. *Pottery Gaz.*, **70** [812] 89–95 (1945). L.C.C.

Corning Glass Works in Canada. ANON. *Bull. Amer. Ceram. Soc.*, **24** [7] 233 (1945).

Glass Container Institute setup approved. ANON. *Bull. Amer. Ceram. Soc.*, **24** [7] 233 (1945); see "Nondefendants . . .," *Ceram. Abs.*, **24** [6] 117 (1945).

Glass-lined equipment. ANON. *Chem. Age* [London], **50** [1295] 395 (1944).—Glass-lined vessels are used with complete satisfaction in the handling of all mineral and inorganic acids, including hydrochloric acid, wet chlorine, and other acids of the halogen group except hydrofluoric, under concentrations and at temperatures up to 345°C., according to the size of the piece, the pressure conditions, and other possible factors which may change the gallonage rating. The limits of capacity and pressure are approximately as follows:

	Temp. (°C.)
Vessels up to 3000 gal. handling HCl at	120–150
" " " 1500 " " " "	230–260
" " " 750 " " " "	290–315
" " " 100 " " " "	315–345

The short life of some glass linings is due to additives that are not capable of being handled satisfactorily in glass or to imperfect base material (steel). Even with "specification steel" and the most rigid metallurgical testing, it is possible to use steel that does not afford an ideal base for the application of glass. A suitable glass has almost unlimited resistance to most acids. Glass fails in contact with hot caustics, particularly sodium and potassium hydroxide, and also the alkaline-earth alkalis, although small percentages of these alkalis involved in a high-velocity reaction might have little effect on the glass. Saturated solutions of alkalis result in a progressive etching and eventual destruction of the glass. On the other hand, alkaline solutions to a pH of 10 at room temperature, and sometimes higher, have been handled with satisfactory results. A combination of required acid resistivity in the glass with a pH of about 9 necessitates the use of a piece which is not available in any single material of construction; hence, glass-lined vessels are the most practical all-round units. To avoid such combinations, however, it is desirable to conduct acid reaction in one vessel if possible and the alkaline reactions in another. Hydrofluoric acids, all the fluorides, and commercial phosphoric acid, if it contains

fluorides as an impurity, cannot be handled in glass without some chemical attack. A.B.S.

Glass research turns to crystal chemistry. N. J. KREIDL. Read before the Ann Arbor Section of the American Chemical Society; abstracted in *Glass Ind.*, **25** [9] 409, 425 (1944).—In glass chemistry, products of widely varying composition exhibit almost identical properties. Glass technologists have turned to crystal chemistry for explanation. Though oversimplified, the initial approach has been fertile with its "network former" and "network modifier" concepts based on rules governing the charge and the apparent size of ions. A more general concept is emerging which restores their individuality to all chemical constituents. Bond strengths between cation and anion are controlling factors in determining whether a composition is to be a volatile molecular compound, a soluble ionic crystal lattice, or a continuously linked network. Polarization and charge distribution are also important factors in establishing structures. There is a continuous transition between network formers and network modifiers. Ions such as Mg, Zn, Be, Al, La, Ti, and Zr and even K, Pb, Li, Ba, and Ca can definitely participate in the network. The tendency to network formation parallels surface-tension factors. To derive glasses with novel optical properties, more must be known about the principles underlying the vitrification of polynary systems, the limits of glass formation, and solubility. The competition of cations for oxygen bonds determines miscibility. If two out of three component ions are different, they must be very different to permit oxygen alignment. For subgroup elements polarization and charge distribution must be accounted for, but for main group elements glass formation appears possible if the difference between z/a^2, charge over the square of interionic distance, is larger than 0.7 in binary and 0.07 in ternary glasses. The structural type of the glass is further revealed by breaks in the solubility-composition curves. A.P.

Heat-insulating phosphorus-aluminum glass. N. V. GOLUBEVA AND I. M. PROK. *Zhur. Priklad. Khim.*, **17** [7–8] 422–26 (1944).—A new composition of heat-protecting glass of high chemical stability to water and acids was developed. Raw materials were selected, and the undesirable influence of some admixtures and especially of TiO_2 was examined. An operating process of glassmaking was worked out and sent to the glass plant.

Machining glass-reinforced plastic with cemented carbide tools. HARRY CRUMP. *Amer. Machinist*, **89** [7] 91–93 (1945).—Glass-reinforced plastic is a mechanical combination of glass fiber reinforcing members encased in, or bound together by, a plastic material. The method of machining and the tools used are described in detail. Care must be taken to remove the dust from machining operations as it constitutes a hazard to the personnel, irritating the skin and respiratory organs. M.HA.

Refractive-index standards of fluorcrown glass. LEROY W. TILTON. *Jour. Research Nat. Bur. Standards*, **34** [6] 599–608 (1945); RP 1659. Price 5¢ from Supt. of Documents, Washington, D. C.—Refractive-index samples of fluorcrown glass, which provide solid standards in the index range between fused quartz, $n_D = 1.458$, and low index silicate crown glass, $n_D = 1.51$, are characterized by very low temperature coefficients of index and thus are especially recommended for use at extreme room temperatures. The calibration of such standards may be facilitated by comparisons with the precise data tabulated from six of these glasses in the temperature range 15° to 55°C. Because of surface weathering, repolishings are sometimes necessary to avoid hazy and possibly false critical lines. In some cases bright bands appear in the dark portion of the refractometer field. These are interpreted as critical-angle phenomena corresponding to decomposition products in the surface layers. R.A.H.

Slag wool as insulating material for heat and cold protection of pipe lines, tanks, etc. ANON. *Teer u. Bitumen*, **41**, 190–91 (1943); abstracted in *Chem. Zentr.*, **1944, I** [2] 118.—A brief survey of the properties and possibilities of application of insulating materials obtained from blast-furnace slag. M.HA.

Games Slayter and Fiberglas. ANON. *Bull. Amer. Ceram. Soc.*, **24** [7] 229–33 (1945).—1 photo, 11 references.

Strains in glass produced by applied color labels. J. E. ABLARD. *Jour. Amer. Ceram. Soc.*, **28** [7] 189–95 (1945). —5 references, 8 figures.

Uviol borate glass for bactericidal lamps. V. P. DANILOV AND Z. A. JOFFE. *Compt. Rend. Acad. Sci. U.R.S.S.*, **39** [6] 234–36 (1943).—The characteristic property of a bactericidal lamp is its transmission of the Hg line of wave length 254 mμ. Such glass should at the same time almost entirely absorb the shorter waves of the spectrum because they adversely affect human organism. The purpose of this investigation was to find the composition of such glass that could be prepared from materials requiring no special preparations. This eliminated all the silicate and borosilicate uviol glasses, because these require a highly purified sand, and also phosphate glass. Under the influence of ultraviolet irradiation, phosphate glass loses its transparency and becomes unfit for use. Furthermore, many of the phosphate glasses can be joined neither to metal used in making the lamp nor to nonphosphate glass. The raw material used in preparing the desired glass was B_2O_3, $BaCO_3$, hydrated Al_2O_3, and Na_2CO_3. The raw material contained a minimum of Fe_2O_3, which did not exceed 0.01%. In compounding the glass it was required that its coefficient of expansion differ only slightly from that of the lead-in and that the glass be sufficiently chemically resistant when used in closed rooms. Two compositions were finally chosen, (1) B_2O_3 55, Al_2O_3 17.5, BaO 20.0, and Na_2O 7.5%, and (2) B_2O_3 60, Al_2O_3 15.0, and BaO 25.0%. The glasses were much alike. The fusion was carried out at 1150°; both were "long glasses" and were worked at 850° to 900°. They crystallized slower than Fourcault window glass. The glasses studied, including these two, show a tendency to cloud when worked in a glass blower's burner. The clouding is apparently due to gases dissolved in the glass. This is particularly bothersome in making the ends of the bulbs. It can be overcome by using for the ends glass No. 23 from the Druzhnaya Gorka plant. Of the two glasses chosen, the first is somewhat more chemically resistant, but the second is better handled in a burner. The effect of B_2O_3 was studied by varying its content from 40 to 60%. Raising the B_2O_3 content lowers the chemical resistance of the glass but has a favorable effect on the other properties. It extends the softening interval, diminishes the tendency of the glass to crystallize, and increases the resistance to "solarization." In addition, B_2O_3 is relatively free of Fe_2O_3, and if it should be contaminated with the Fe_2O_3, this can be easily removed. Raising the B_2O_3 content above 60% is inadvisable because the chemical resistance of the glass drops considerably. The BaO content was varied from 20 to 40%. BaO raises the chemical resistance. It was chosen in preference to other alkaline earth oxides since it is least contaminated with Fe_2O_3. Increasing the BaO content beyond 40% renders the glass too "short." Al_2O_3 is incorporated in the glass to increase its chemical resistance and extend its softening interval. Increasing the Al_2O_3 content above 20% increases the tendency of the glass to crystallize. In addition, during the fusion of mixes rich in Al_2O_3, a pellicle is formed on the surface of the melt which is apparently a high melting boro-aluminate glass. It is preferable to use hydrated Al_2O_3 in the batch since Al_2O_3 dissolves with difficulty in B_2O_3. Al_2O_3 also frequently contains Fe_2O_3, which is hard to remove. The primary purpose of Na_2O is to inhibit crystallization in glasses containing considerable quantities of Al_2O_3. The optimum Na_2O content does not exceed 7.5%. In industrial practice, a suitable lining must be provided for the melting pots to prevent Fe from the lining from contaminating the glass. Samples of glass tested in lamps transmitted 40% of $\lambda = 254$ mμ, whereas tested samples of U. S. lamps transmitted only 20%. M.HO.

What next in the glass trade? H. MOORE. Presented at meeting of the Society of Glass Technology; *Pottery Gaz.*, **70** [811] 41–46 (1945). L.C.C.

Your future in glass. ANON. *Coronet*, **17** [5] 95–110 (1945).—Twenty-one color photographs show some of the

basic facts about glass, how it is made, and some of its wonders for the future. M.E.P.

PATENTS

Apparatus for determining the flatness of glass plates. B. H. VINE (Pittsburgh Plate Glass Co.). U. S. 2,379,263, June 26, 1945 (Nov. 19, 1943). 5 claims. Cl. 88-14.

Apparatus for sealing glass tubes. W. O. LUERTZING (E. Machlett & Son). U. S. 2,378,146, June 12, 1945 (May 20, 1943). 6 claims. Cl. 49-7.

Bending glass. C. F. BINKERT AND J. E. JENDRISAK (Libbey-Owens-Ford Glass Co.). U. S. 2,377,849, June 12, 1945 (Aug. 29, 1942). 10 claims. Cl. 49-84.

Bifocal lens blank. GEORGE A. CLEMENT. Can. 426,620, April 10, 1945 (Aug. 19, 1943). G.M.H.

Coating for fibrous glass strands. A. L. SIMISON (Fiberglas Canada, Ltd.). Can. 426,112, March 13, 1945 (Feb. 9, 1942). G.M.H.

Continuous glass strip producing apparatus. F. B. WALDRON (Pilkington Bros., Ltd.). Can. 425,217, Jan. 23, 1945 (Sept. 27, 1943; in Great Britain Oct. 31, 1942). G.M.H.

Drawing of glass tubes of exactly defined diameter. JAKOB DICHTER. Fr. 880,000, March 10, 1943 (March 5, 1942); abstracted in *Chem. Zentr.*, **1944, I** [15] 885.—The tubes are drawn from tubes of larger diameter by using a caliper and additional burners that soften the glass at the places where it is to be drawn. M.HA.

Electric-lamp manufacture. P. E. MOES AND M. E. MCGOWAN (Canadian Westinghouse Co., Ltd.). Can. 426,091, March 13, 1945 (April 27, 1942; in U. S. June 20, 1941). G.M.H.

Electric vertical furnace for three-phase current for melting glass. DEUTSCHE TAFELGLAS AKT.-GES., DETAG. Fr. 880,618, March 31, 1943 (March 30, 1942); abstracted in *Chem. Zentr.*, **1944, I** [21/22] 1213.—The molten glass serves as resistance, and the three electrodes are immersed in the molten glass. M.HA.

Electrical discharge tube, particularly a luminescent tube for the manufacture of which luminescent glass according to Ger. 716,044 has been used. GLASWERK GUSTAV FISCHER (Hellmuth Fischer, inventor). Ger. 740,854, Nov. 29, 1943 (Dec. 3, 1936); cl. 21*f*; supplement to Ger. 716,044; abstracted in *Chem. Zentr.*, **1944, I** [4] 239.—Of several glass layers lying one over another according to Ger. 716,044, the inner layer is so weak that it absorbs only a part of the ultraviolet light and permits a part to reach the outer layer. The inner glass layer is formed of a glass that is excited by the ultraviolet light of shortest wave length and the second layer of a glass excited by ultraviolet light of longer wave length. To obtain a blue-green light, the wall consists of an inner (lead-containing) glass layer luminescing in blue, over which a green luminescent (uranium-containing) glass layer is arranged. The excitation to luminescence is produced mainly by mercury vapor under low pressure. A greenish-white light is obtained with an inner wall of a reddish luminescent (stannous oxide-containing) glass layer over which a green luminescent (uranium-containing) glass layer is placed. To obtain a reddish-yellow light, the inner wall is of a yellow luminescent (niobium-containing) glass layer with an outer reddish luminescent (stannous oxide- or molybdenum-containing) glass layer. M.HA.

Felted mineral wool product manufacture. H. T. COSS, J. H. ZETTEL, AND L. A. HAWTHORNE (Johns-Manville Corp.). Can. 425,329, Jan. 30, 1945 (April 23, 1942; in U. S. April 24, 1941). G.M.H.

Glass article making method. R. H. DALTON (Corning Glass Works). Can. 425,825, Feb. 27, 1945 (April 4, 1942; in U. S. March 31, 1941). H. H. BLAU (Corning Glass Works). Can. 425,827, Feb. 27, 1945 (Aug. 3, 1943). G.M.H.

Glass article transferring machinery. W. L. MCNAMARA (Anchor Hocking Glass Corp.). Can. 427,635, May 22, 1945 (Sept. 18, 1942; in U. S. Sept. 20, 1941). G.M.H.

Glassforming apparatus. J. T. LITTLETON. (Corning Glass Works). Can. 425,826, Feb. 27, 1945 (July 8, 1943). G.M.H.

Glassforming machine. S. D. BERT (one third to M. A. Yorkin and one third to J. D. Martin). U. S. 2,378,176, June 12, 1945 (Feb. 8, 1940; April 7, 1942). 2 claims. Cl. 49-42.

Glassmaking batch. L. H. DAVIS, administrator of estate of JOHN FERGUSON (Newton Research Laboratories, Inc.). Can. 426,262, March 20, 1945 (Jan. 16, 1941). G.M.H.

Glassmelting furnace. W. A. MOORSHEAD (United Glass Bottle Manufacturers, Ltd.). Can. 426,279, March 20, 1945 (Oct. 13, 1942; in Great Britain Nov. 26, 1941). G.M.H.

Glass receptacle. R. C. COBEL (A. H. Heisey & Co.). U. S. 2,378,355, June 12, 1945 (Nov. 2, 1943). 6 claims. Cl. 222-189.

Glass solution. R. N. WENZEL (Canadian Westinghouse Co., Ltd.). Can. 425,667, Feb. 20, 1945 (July 21, 1942). G.M.H.

Glass-supporting frame. G. Z. MINTON (Pittsburgh Plate Glass Co.). U. S. 2,379,244, June 26, 1945 (March 2, 1944). 5 claims. Cl. 49-45.

Glass-tempering apparatus. J. K. JACKSON (Corning Glass Works). Can. 426,526, April 3, 1945 (Dec. 10, 1940; in U. S. Jan. 11, 1940). G.M.H.

Glass tubing drawing apparatus. C. H. GREENE (Corning Glass Works). Can. 426,527, April 3, 1945 (May 14, 1942; in U. S. May 7, 1941). G.M.H.

Glassware manufacture. J. W. GREENBOWE, A. H. LAIDIG, AND W. F. KELLY (Canadian Westinghouse Co., Ltd.). Can. 427,171, May 1, 1945 (Feb. 13, 1943; in U. S. April 28, 1942). G.M.H.

Glassware-transferring device. W. L. MCNAMARA (Anchor Hocking Glass Corp.). Can. 426,081, March 13, 1945 (Nov. 4, 1941; in U. S. Dec. 7, 1940). G.M.H.

Glassworking apparatus and method. BRITISH-THOMSON HOUSTON CO., LTD. Brit. 569,293, May 30, 1945 (Nov. 21, 1942).

Hollow body molding method. A. M. HOWALD AND L. S. MEYER (Libbey-Owens-Ford Glass Co.). Can. 424,961, Jan. 9, 1945 (Feb. 3, 1943; in U. S. June 24, 1942). G.M.H.

Hollow glass article making method. LOUIS POGLEIN (McKee Glass Co.). Can. 425,707, Feb. 20, 1945 (June 9, 1943). G.M.H.

Ink for glass. J. C. WILSON (Canadian Westinghouse Co., Ltd.). Can. 424,925, Jan. 9, 1945 (Oct. 1, 1940; in U. S. Oct. 31, 1939). G.M.H.

Laminated glass and closure. T. H. MCCLAIN (Lockheed Aircraft Corp.). Can. 425,978, March 6, 1945 (June 18, 1942). G.M.H.

Manufacture of endless glass threads of great fineness. WERNER SCHULLER. Fr. 879,503, Feb. 25, 1943 (Feb. 20, 1942); abstracted in *Chem. Zentr.*, **1944, I** [21/22] 1213.—The threads are drawn by a wheel with a peripheral speed of more than 1500 m./min. (4430 ft./min.). M.HA.

Manufacture of silicate-containing inorganic fibers, especially glass fibers. N. V. MIJ. TOT BEHEER EN EXPLOITATIE VAN OCTROOIEN. Swiss 226,880, Aug. 2, 1943 (May 26, 1937); abstracted in *Chem. Zentr.*, **1944, I** [19/20] 1120–21.—The fibers are drawn out mechanically through small openings from a pot containing the molten mass. The process is characterized in that (1) the mass is heated so much that it is fluid at least at the openings, emerges in a continual stream from the openings, is transformed directly after leaving the openings into fine threads, and is thereby cooled so much and so rapidly that it assumes a strength sufficient for the further drawing; (2) several threads drawn continually side by side through a corresponding number of openings are made into a single thread and coiled. The melt is heated to 1200° to 1600°C. M.HA.

Mineral-wool product. J. H. ZETTEL (Johns-Manville Corp.). Can. 425,844, Feb. 27, 1945 (May 25, 1943; in U. S. June 12, 1942). G.M.H.

Mineral wool and product manufacture. H. T. COSS,

W. M. MacAlpine, and L. A. Hawthorne (Johns-Manville Corp.). Can. 425,330, Jan. 30, 1945 (May 11, 1942). G.M.H.

Mineral wool product manufacture. H. T. Coss (Johns-Manville Corp.). Can. 425,331, Jan. 30, 1945 (Nov. 25, 1942; in U. S. Nov. 25, 1941). G.M.H.

Mirror-making method. C. A. Trevail and K. P. Gladney (Hobbs Glass, Ltd.). Can. 425,446, Feb. 6, 1945 (Sept. 3, 1943). G.M.H.

Optical objective. Arthur Warmisham. U. S. 2,379,392, June 26, 1945 (July 20, 1943; in Great Britain March 29, 1943). 7 claims. Cl. 88-57. C. G. Wynne. U. S. 2,379,393, June 26, 1945 (July 20, 1943; in Great Britain March 29, 1943). 6 claims. Cl. 88-57.

Parallel glass fiber product. A. L. Simison (Fiberglas Canada, Ltd.). Can. 426,538, April 3, 1945 (Feb. 14, 1944; in U. S. Feb. 13, 1943). G.M.H.

Phenolic resin with glass fibers. R. W. Auxier (Canadian Westinghouse Co., Ltd.). Can. 425,665, Feb. 20, 1945 (June 5, 1942). G.M.H.

Plunger carrier for glassware-forming apparatus. O. H. Samuelson and A. T. Zappia. U. S. 2,379,830, July 3, 1945 (March 8, 1944). 4 claims. Cl. 49-76.

Process and apparatus for producing laminated safety glass. W. J. Hubbard (Libbey-Owens-Ford Glass Co.). U. S. 2,378,016, June 12, 1945 (Dec. 13, 1943). 19 claims. Cl. 154-2.70.

Process and device for drawing finest glass threads from a glass melt. Werner Schuller. Swiss 225,959, June 1, 1943 (Feb. 23, 1942); abstracted in *Chem. Zentr.*, **1944, I** [15] 884.—The melt from which the glass threads are drawn is formed by melting solid glass bodies brought into contact with the melt which have a considerably greater length than section. Into the individual small melting vessels open at the upper part and provided with orifices at the bottom, glass bodies are inserted of such section, and the walls of the individual melting vessels are kept at such temperature, that the glass bodies melt off at contact with the walls and fill the vessels with glass in such manner that the molten glass rises over the edge of the melting vessels and forms a semirigid glass packing between the glass bodies and the walls so that the subsequently pushed-in glass body can exert a piston action on the glass melt in the melting vessel. M.Ha.

Production of filaments of substances plastic when hot, especially of molten glass. Allgemeene Kunstvezel Mij. N. V. Swiss 225,761, June 1, 1943 (Dec. 4, 1940); abstracted in *Chem. Zentr.*, **1944, I** [15] 884–85.—The process is characterized in that the threads formed from the molten substance are moved in the flow direction of the mass along an endless rotating surface permeable to gas and thereby brought into contact with the surface for a short time by a difference in pressure created on the other side of the rotating surface and held to the latter so that the desired drawing effect is exerted on the mass currents by the contact. M.Ha.

Sealing of electrically conducting leads through vitreous walls. General Electric Co., Ltd., H. L. Breadner, and C. H. Simms. Brit. 569,317, May 30, 1945 (Oct. 25, 1943).

Sealing metal to glass. Standard Telephones & Cables, Ltd., and T. W. Wingent. Brit. 569,150, May 16, 1945 (Nov. 2, 1943).

Separating glass sheets, etc. J. A. McCormick, Jr. (Dearborn Glass Co.). U. S. 2,378,091, June 12, 1945 (Nov. 29, 1941; June 5, 1944). 3 claims. Cl. 49-77.

Silica fiber making method. H. P. Hood (Fiberglas Canada, Ltd.). Can. 426,246, March 20, 1945 (Feb. 7, 1942). G.M.H.

Skeleton frame for supporting glass. L. V. Black (Pittsburgh Plate Glass Co.). U. S. 2,379,213, June 26, 1945 (March 2, 1944). 7 claims. Cl. 49-45.

Sodium calcium borosilicate glass. Urban E. Bowes. Can. 425,899, March 6, 1945 (Dec. 20, 1940). G.M.H.

Vitreous compositions. British Thomson-Houston Co., Ltd. Brit. 569,308, May 30, 1945 (July 1, 1942).

Structural Clay Products

Experimental and calculated data on clay winning and clay conveying. K. Spingler. *Tonind.-Ztg.*, **66**, 303 (1942); abstracted in *Trans. Brit. Ceram. Soc.*, **43** [2] 20A (1944).—In any calculation related to the winning of clay, it is necessary to know the probable output of the plant; allowance must also be made for the variable water content of the clay. The clay requirements for brick manufacture are tabulated. For calculation purposes, the performance of different clayworking machines as compared with that of handwork should also be tabulated. As a basis for calculation, the concept of output per unit working time is introduced. The output of one worker in clay mining is given, and the outputs of different types of excavators, including the navvy and dragline, are tabulated. The dimensions of the clay tubs used for haulage also enter the calculation; the relative merits of Diesel, electric, and steam locomotives are discussed. Conveyer belts for use in the clay pit are also described.

Mechanical traveling brickworks. Kauer. *Tonind.-Ztg.*, **66**, 325 (1942); abstracted in *Trans. Brit. Ceram. Soc.*, **43** [2] 19A (1944).—Several machines driven by a Diesel motor are erected on a rigid steel framework fitted either with solid rubber wheels or a caterpillar. The group consists of a clay elevator, two rolls in tandem, and a brick pug either alone or combined with a clay shredder. The machine is moved by means of a towrope or caterpillar track. With a movable brickmaking plant of this design and the requisite team of brickmakers, at least 2.6 million brick can be manufactured in 130 days. A group of pugs is driven from a central shaft. A repair and mouthpiece plant is available to deal with worn parts and breakages and to ensure the use of the correct type of die for the different raw materials. Pug heads of various lengths are available, and the mouthpiece, made of beech wood, is adapted to suit the properties of the clay.

Place of terra cotta in postwar building—with special reference to the problem of atmospheric pollution. Anon. *Brit. Clayworker*, **53** [629] 76–77 (1944).—The structural decay of building materials in Great Britain alone is estimated to have involved a loss of about £70,000,000 in the last 30 years. The Parliament House, an outstanding example, was estimated before the war to require 12 years' work for repairs at a cost of about £750,000. In this case, the rusting of iron dowels and tierods has caused trouble, and atmospheric pollution has hastened the failure of the Caen stone. The action of a polluted atmosphere on building materials is twofold: discoloration and disfigurement are caused by soot, and flaking and disintegration by SO_2 and ammonium sulfate. Postwar builders must pay serious attention to choice of material, and terra cotta appears to be one of the most satisfactory. The Department of Scientific and Industrial Research issued a report in 1928 showing that terra cotta stands up well to exposure to town atmosphere, the few exceptions consisting of underfired material. Terra cotta of the 18th century in and near London is still in excellent condition, and this is especially noteworthy since, unlike modern glazed terra cotta, it was not specifically intended for resistance to corrosion. In Italy, many examples of terra cotta of the Renaissance period are still in a good state of preservation, even in cities and towns which have since become industrialized. Terra cotta also resists discoloration and disfigurement and is easily and quickly cleaned with soap and water. The aesthetic possibilities of terra cotta are great, but the material should not be abused. Effects should be obtained by the use of the delicate and soft hues which modern ceramic art has made available, and discreet color contrasts may be combined with such features as recessed fenestration, projecting mullions and bands, and modeled decoration in low relief. The forms of carved

stone and the use of strong color should be avoided. The modern tendency is to use terra cotta rather as a covering than as a weight-bearing and functional element. 1 photo. L.C.C.

Recent developments in hollow blocks and roofing tiles. ANON. *Brit. Clayworker*, **54** [636] 8–9 (1945).—The proposal to use hollow clay blocks in new building schemes is being revived. One inventor claims speed of erection and superior insulating and weather-resisting qualities for a standard block 13.5 x 8 x 6.5. This is grooved on the upper and lower sides and has a surface roughening (rustication) on the exposed face. It is pointed out, however, that the number of "specials" required for even the simplest external walling is considerable, and the adaptable and time-saving qualities of the common brick are given. Moreover, different tools and handling technique would require the operative to become more of a mason than a bricklayer. Roofing tile show more originality. The "anchor" tile has been designed to prevent sudden falls of snow from the roof, and the "channel" tile (a combination of eaves tile and half-round gutter) has possibilities. L.C.C.

Slate debris may become brick. ANON. *Cement, Lime and Gravel*, **19** [8] 264 (1945).—Millions of tons of slate waste have accumulated at Ballachulish, Scotland. A new brickmaking process is to be tried out. L.C.C.

PATENTS

Brick for constructional purposes. WOODALL-DUCKHAM, LTD., AND A. R. COWLEY. Brit. 569,166, May 24, 1945 (July 16, 1943).

Refractories

Action of alkalis on refractory materials: XVI, Cone deformation study of certain alkali-silica-alumina and alkali-silica-alumina-ferric oxide mixtures. F. H. CLEWS, H. M. RICHARDSON, AND A. T. GREEN. Reprinted in *Trans. Brit. Ceram. Soc.*, **44** [2] 21–24 (1945); see *Ceram. Abs.*, **23** [5] 89 (1944). R.A.H.

Basic brick: I. ANON. *Iron and Steel*, **18** [4] 110–16 (1945).—The Palliser works at West Hartlepool, England (in operation since 1938 using a process devised by the Steetley Lime & Basic Co., Ltd., and Dr. Chesny), claims (with Magnesium Elektron, Ltd.) to be the first producer in the world of magnesium from sea water on a commercial scale. By the end of 1938, 10,000 tons of magnesia had been produced, all as a result of private finance. A large works has since been erected at Cumberland. The process is described. See "Magnesia . . .," *Ceram. Abs.*, **23** [4] 72 (1944); **24** [5] 91 (1945); "Production . . .," *ibid.*, **24** [6] 108 (1945). A.B.S.

Heating of open-hearth furnaces with mixed coke-oven and blast-furnace gas. R. W. EVANS. *Jour. Iron & Steel Inst.*, **149** [1] 395–417P, 443–66P (1944).—The principles of flame development are discussed; it is shown that high-temperature flames are the result of rapid combustion. The role of the flame in an open-hearth furnace during (1) melting and (2) refining of the charge is described, with a note on refining with nonluminous flames; refining with a nonluminous flame renders the process inflexible. Slag foams are next discussed. The foam is due to high surface tension in the slag, which can easily be reduced by the introduction of a more luminous flame; hence, foams are due more to the nature of the flame than to that of the slag. Foaming slags react seriously on output and furnace wear. The development of luminosity in mixed coke-oven and blast-furnace gas flames is due to the cracking of hydrocarbons, and the degree of luminosity that may be expected from a given mixture is shown. The nature of the cracking and of the resulting carbon particles depends on the temperature; the size of particles precipitated affects the degree of luminosity. Loss of calorific value in coke-oven gas owing to preheating is discussed, and it is suggested that it may be more efficient to preheat blast-furnace gas only. The effect of moisture content is shown theoretically to have an adverse effect on luminosity. Furnace design with particular reference to the gas port is discussed, with a note on port water-cooling, port slope, and gas velocity. Different methods of introducing artificial illuminants are described. Mixed gases require plenty of air. Sloping back walls improve the roof life, but the roof should not be low. The operation of mixed-gas furnaces is dealt with, and the instrumentation is described. Dolomite consumption is less in mixed-gas than in producer-gas practice. Metallurgically, mixed-gas furnaces do not oxidize the bath so readily, owing, it is suggested, to free hydrogen in contact with slag hindering the transference of oxygen to the slag. E. suggests that where the coke-oven gas is lean, it can more efficiently be injected cold with tar as an illuminant. Preheating of the air supply only is then necessary. 7 references.

Insulation of heat-treatment furnaces. Selection of materials and their applications. R. J. SARGENT. *Iron & Coal Trades Rev.*, **150** [4027] 665–68 (1945).—Insulation of the following main types is used in heat-treatment furnaces: (1) lightweight materials, usually having as a base diatomaceous earth or diatomite, located in the furnace as an external lining; (2) a dense grade of the same base material of greater mechanical strength, for use, e.g., in furnace hearths, frequently referred to as "solid grade" insulating brick; and (3) hot-face insulating materials or high-temperature insulating refractories. The behavior of the furnace with these materials is discussed from the viewpoints of (*a*) heat flowing through the structure under steady conditions and lost to the atmosphere, and (*b*) heat storage in the structure. As insulating brick may contain a higher proportion of fluxing constituents than the denser type of refractory, their shrinkage at the temperatures involved should be known. Where strongly reducing conditions are to be expected the Fe_2O_3 content should be below 2%, but insulating refractories are not so subject to disintegration under reducing conditions. A low total flux content is desirable to give good refractoriness and to avoid incipient vitrification with accompanying serious shrinkage. Cold crushing strength of 150 lb./sq. in. is regarded as a sufficient minimum for external lining material. The hot-face materials should have good mechanical strength. Spalling in these materials, due often to physical changes, is avoided by the use of large-size grog, a high degree of porosity, and low vitrification. The choice of insulating materials and economic thickness depends on the thermal effect produced, the economic value of the heat transfer, cost of insulation, building and maintenance, useful life of insulation, and improved results from better temperature uniformity. Properties of some British materials, locations for insulation, and combinations of the different materials in a furnace are discussed. M.HA.

Maintenance of vertical retorts. R. N. HATELEY. *Gas Jour.*, **245** [4274] 500–502 (1945).—The routine examination and repair of vertical retorts and their settings at Walsall, England, is described. Repairs are carried out regularly every third summer on one third of the retorts. Due to the absence of cleaning apertures, the carbon monoxide nostril tile tend to become slagged. This was minimized by omitting coke breeze from the producer fuel. A temperature of 1360° to 1380°C. at the bottom of the combustion chamber and 1100°C. at the top was maintained with a throughput of 6.5 tons of coal carbonized per day. Leakage of gas from the retorts during operation has been kept down by the blowpipe spray welding device (see *Ceram. Abs.*, **19** [6] 141–42 (1940)). In the discussion, C. R. E. Turner states that at Birmingham similar retorts were let down every five years. L.R.B.

Methods of testing stopper heads. J. A. SHEA. Presented at meeting of Chicago Section of National Open Hearth Committee, Iron and Steel Division, A.I.M.E.; abstracted in *Ind. Heating*, **12** [6] 1016 (1945). M.HA.

Properties of refractory materials and their significance to fuel economy. A. T. GREEN AND A. E. DODD. *Jour.*

Inst. Fuel, **18**, 74–79, 90 (1945); *Gas World*, **122**, 80–83 (1945); abstracted in *Iron & Coal Trades Rev.*, **150** [4018] 319–20 (1945).—The close relationship between effective fuel utilization and the properties of the lining materials of the furnace is discussed. Durability and thermal behavior are of the greatest importance. Fire-clay products have the widest economic application, but silica brick have certain properties particularly suited to service in the carbonizing and steel industries. To resist severe slagging conditions and to give improved thermal behavior in certain furnaces, silicon carbide brick are used in muffle linings, recuperators, and retorts; for the same purposes, fused alumina brick are also used. Zirconium brick have recently been employed with good results in furnaces melting aluminum, while carbon refractories are used in blast-furnace hearths. Thermal spalling will occur if the differential expansion of the surface of furnace brickwork under a temperature gradient is greater than the elastic properties of the brick can withstand. Three factors are involved: (1) the rate of change of temperature which can be effected in the interior of the refractory mass, (2) the elastic and viscous properties of the material, and (3) the nature and extent of the volume changes set up by rapid fluctuations of temperature. Spalling may also occur as a purely mechanical effect or as a physical effect following localized slagging of the brickwork. Spalling in any case seriously impairs the life of the furnace. Slag penetrates the surface layer of the brickwork and solidifies behind the working face, thus forming adjacent layers of material differing in their expansion characteristics and causing progressive disruption along the heterogeneous boundary. Slag attack is said to be the major cause of failure in 75% of industrial furnaces. Reducing gases also have a disintegrating action on refractories, as shown in the blast furnace where the carbon monoxide content of the furnace atmosphere is comparatively high. This gas, in the range 400° to 600°C., tends to decompose into carbon dioxide and solid carbon, the reaction being accelerated by the presence of certain iron compounds. Hydrocarbon gas at higher temperatures can have a similar disintegrating action. Although the difficulties have been overcome by the development of better refractories, the operation of furnaces under reducing conditions should be avoided where possible, except, of course, where that is just the purpose of the furnace, e.g., in heat-treating. The durability of furnace masonry is often a compromise between the life of the brickwork and that of the jointing material. A firebrick jointing cement must have workability. To obtain this, clay or bentonite is usually added; this, however, leads to shrinkage during drying and firing which, if very pronounced, may pull the joint away from the brick. This makes the masonry very permeable, and in-leakage of cold air or escape of hot combustion gases results. A fluxing agent, e.g., sodium silicate, is sometimes added to jointing cements which also serves to give an air set to the cement. An admixture of sodium silicate reduces the refractoriness of the cement. Jointing cements must therefore be selected on the basis of a full knowledge of operating conditions. M.Ha.

Repair of silica coke-oven walls by spray welding. G. A. Phillipson. *Coke Smokeless-Fuel Age*, **7** [70] 45–48 (1945).—To avoid cooling down silica coke ovens for repair, spray welding, developed by T. F. E. Rhead (see "Hot . . .," *Ceram. Abs.*, **19** [6] 141 (1940)), was applied. The cement container, welding burner, and technique are described in detail. The oven walls should be held at about 1100°C. The proprietary silica cement fuses at 1560°C. as compared with 1625°C. for the coke-oven brick. The greater part of the cement will pass a 72-mesh sieve. The true specific gravity of the weld was 2.264, and the bulk density 1.565 gm. per cc., showing that the silica cement had been fused and that the weld was porous. A special coke-oven door containing a vertical slit to admit the spray burner is convenient, or a sheet-iron shield may be used. Chains can be used to support the burner from above. It should be made clear that although cement is used, the adherence is obtained by fusing the cement in its passage from the spray burner tip to the wall in the oxy-coal gas flame burning there. L.R.B.

Report of Refractories Division Research Committee. Earl C. Petrie, Chairman. *Bull. Amer. Ceram. Soc.*, **24** [7] 265 (1945).

Terms of contract for boiler-furnace walls. German Ministry of Economics. *Tonind.-Ztg.*, **66**, 311 (1942); abstracted in *Trans. Brit. Ceram. Soc.*, **43** [3] 40A (1944).—The wall thickness and quality of brick to be used in the various parts of boiler furnaces are specified. The firebrick used are classified solely according to their Al_2O_3 content and refractoriness; the highest quality contains over 44% Al_2O_3 (refractoriness cone 34 or over), and the lowest quality below 30% Al_2O_3. Insulating refractories are specified for the backing of the combustion chamber.

Theory of the arc furnace. P. Drossbach. *Z. Elektrochem.*, **46**, 643, 668 (1940); abstracted in *Trans. Brit. Ceram. Soc.*, **43** [2] 27A (1944).—The theory of the arc furnace for steel melting is developed. The rate of increase in size of the melting zone, the energy distribution in the furnace, and the superheating of the metal are the chief topics considered.

Use of basic-lined ladles in the desulfurization of cast iron by sodium carbonate. N. L. Evans. *Jour. Iron & Steel Inst.*, **149** [1] 171–91P (1944).—A large tonnage of cast iron is desulfurized by treatment with sodium carbonate, the process normally being carried out in ladles lined with firebrick, ganister, or similar siliceous refractory. These linings are attacked by soda slag, thereby impairing the efficiency of the process by contamination of the slag with silica. To meet demands for an improved degree of desulfurization in the treatment of high-grade cast iron, the use of basic-lined ladles has been investigated. Refractories used include calcined dolomite ("Basic"), magnesia, and stabilized dolomite, all of which result in greater sulfur reduction than can be obtained in siliceous linings. The most satisfactory material used so far is "Basic" bonded with tar, which is immune to attack by soda slags and has a long life. By its use it has been possible to reduce the sulfur content of certain high-grade cast irons to 0.01% or less. Most of the work described has been carried out on a laboratory scale in a high-frequency induction furnace, but it has been supplemented by full-scale trials. Methods of lining ladles are described, and the technique of repairing and patching is discussed. Sufficient evidence is not yet available to determine definitely whether monolithic or brick linings are preferable, but it is felt that, on grounds of economy and long life, there is much to be said for the former. Unfired brick made of stabilized dolomite may provide a compromise as far as cost is concerned, and they are certainly an interesting departure from normal practice. 6 references, 3 diagrams.

SEPARATE PUBLICATIONS

Energy Requirements and Equilibria in the Dehydration, Hydrolysis, and Decomposition of Magnesium Chloride. K. K. Kelley. *U. S. Bur. Mines Tech. Paper*, **676**, 26 pp. (1945). 9 figs. Price 10¢ from Supt. of Documents, Washington, D. C.—From recently determined heats of formation, specific heats, and entropies of magnesium chloride and its hydrates, a thermodynamic investigation was made of the several distinct reaction steps in the dehydration, hydrolysis, and decomposition of magnesium chloride. R.A.H.

Ironmaking at the Appleby-Frodingham Works of the United Steel Companies, Ltd. G. D. Elliot et al. *Iron and Steel Inst., Special Rept.*, No. 30, 280 pp. (1944).—Under Section V, "Blast-Furnace Refractories," the properties of several brands of brick are listed. Results of a 20-month weathering test show that loss of strength due to storing brick in the open is negligible compared with variations observed in a new consignment. The action of ferrous chloride on firebrick has been examined. Under the test conditions, deposition of ferrous chloride did not lead to disintegration of the brick. The attack on firebrick by blast-furnace slag was studied. Work in connection with taphole clays leads to the conclusion that the

bloating of a suitable clay at about 1100°C. may be a factor in the successful use of that clay. Notes on the care and maintenance of tapholes are given. The development of carbon-brick refractories is discussed, together with notes on tests conducted in furnace runners and while repairing breakouts. In Section VI, "Hot-Blast Stove Refractories," research on stove refractories is described. The effects of the rigidity of the brick are discussed, especially in connection with alkali attack. Notes on stove design and the results of an efficiency test are included. In Section X, "Hearth Breakouts," E. discusses the seriousness of a hearth breakout and distinguishes two main factors common to all breakouts: the type of iron made and the radial position of the breakout. A permanent solution to the problem can be found only in improvements in the construction of the hearth, especially in materials. Well-made carbon brick or blocks should be used in blast-furnace hearths. The angular distance between the taphole and the slag notches should be increased. The hearth wall should be bonded into the hearth floor, thus avoiding the "slape" joint, which appears to be the point of origin of all breakouts. The present hearth shape may be improved by fully battering the hearth wall and dispensing with the usual 12 in. of corbelling at the bottom. The mechanical load on the hearth, including air pressure, should be well below the compressive strength of the hearth brick. 110 illustrations. M.Ha.

PATENTS

Alumina-recovery process. R. W. Brown (Aluminum Co. of America). Can. 426,073, March 13, 1945 (Jan. 15, 1941); in U. S. April 13, 1940). G.M.H.

Basic cast refractory. T. E. Field (Corhart Refractories Co.). Can. 424,928, Jan. 9, 1945 (June 4, 1943). G.M.H.

Basic plastic refractory. R. A. Schoenlaub (Basic Refractories, Inc.). Can. 426,836, April 17, 1945 (July 7, 1943; in U. S. Sept. 2, 1942). G.M.H.

Brickwork for heat-interchanging apparatus. Gas Light & Coke Co. and A. E. Haffner. Brit. 569,381, June 6, 1945 (May 4, 1943).

Cast refractory product. T. E. Field (Corhart Refractories Co.). Can. 424,929, Jan. 9, 1945 (June 4, 1943; in U. S. Oct. 27, 1942). G.M.H.

Magnesia-containing refractory. R. A. Schoenlaub (Basic Refractories, Inc.). Can. 426,834, April 17, 1945 (Jan. 17, 1943; in U. S. July 28, 1942). G.M.H.

Magnesium-mineral processing. Lyle Caldwell. Can. 425,384, Feb. 6, 1945 (Aug. 10, 1943). G.M.H.

Manufacture of brick, refractory brick, etc. Guido Brocchi. Ital. 394,127, Jan. 16, 1941; abstracted in *Chem. Zentr.*, **1944, I** [19/20] 1121.—Brick for lining furnaces are made of a paste comprising SiO_2, alumina, quartz, clay, and firebrick, to which small amounts of sodium fluosilicate, ZnO, and MgO and 2 to 8% bentonite, algina, collignol, or bitumen emulsion are added. M.Ha.

Manufacture of refractory products. Hans Lasch. Ger. 738,638, Aug. 25, 1943 (May 9, 1941); (Cl. 80*b*); abstracted in *Chem. Zentr.*, **1944, I** [2] 118.—The refractories which correspond in their chemical composition to that of the natural mineral celsian ($BaO \cdot Al_2O_3 \cdot 2SiO_2$) are made of BaO, Al_2O_3, and SiO_2 or of raw materials containing those oxides. The method is characterized in that the starting materials, after previous sintering, are melted and formed by casting, after which they are left to solidify, or simple pigs are formed which then are worked further mechanically (by sawing, etc.) by ceramic methods. The original materials can be made with a somewhat higher Al_2O_3 content than corresponds to the formula of celsian. M.Ha.

Obtaining alumina, sulfuric acid, and potassium sulfate. Instituto Nacional de Industria. Brit. 569,008, May 16, 1945 (Nov. 27, 1941).

Preparation of compounds of titanium and zirconium. C. E. Every (Titanium Alloy Mfg. Co.). Brit. 569,054, May 16, 1945 (May 3, 1943).

Reduction apparatus. Ford Motor Co., Ltd. Brit. 559,866, March 22, 1944 (July 24, 1941); abstracted in *Trans. Brit. Ceram. Soc.*, **43** [5] 66A (1944).—A furnace is described for the reduction of magnesia to the metal; carbon blocks are used in the furnace lining.

Refractory body. G. S. Fulcher (Corning Glass Works). Can. 424,930, Jan. 9, 1945 (March 13, 1941). G.M.H.

Refractory compositions. C. E. Every (Titanium Alloy Mfg. Co.). Brit. 569,078, May 16, 1945 (June 21, 1943).

Refractory mass. Veitscher Magnesitwerke Akt.-Ges. Fr. 884,596, Aug. 20, 1943 (July 31, 1942). Ital. 395,145, Sept. 23, 1941; abstracted in *Chem. Zentr.*, **1944, I** [19/20] 1121.—The mass consists mainly of burned magnesite (grain size up to 15 mm.) and powdered refractory slag. The mixture is made up with a water-glass solution and can be used for the manufacture of brick and also for lining rotating tube furnaces. M.Ha.

Refractory-material processing. R. A. Schoenlaub (Basic Refractories, Inc.). Can. 426,835, April 17, 1945 (July 3, 1943; in U. S. Jan. 6, 1943). G.M.H.

Repairing retorts or chambers. West's Gas Improvement Co., Ltd., F. J. West, E. West, and A. G. Bird. Brit. 568,159, April 5, 1945 (Aug. 16, 1943); abstracted in *Woodall-Duckham Tech. Press Rev.*, No. 963, p. 2 (April 25 and May 2, 1945).—A method of repairing a refractory retort or chamber that operates under high-temperature conditions consists in heating the retort, etc., to a high temperature with its normal inlets and outlets closed and then blowing air under pressure (1 to 6 in. water gauge) into the retort to maintain a superatmospheric pressure therein, at the same time introducing the repairing powder or cement in measured doses into the entering air stream. An atmosphere laden with the repair powder is thus maintained in the retort, and the powder is carried into the cracks through which the air escapes; the heat of the walls causes the powder to adhere and seal the crack.

Zirconium oxide refractory. Eugene Wainer (Titanium Alloy Mfg. Co.). Can. 426,574, April 3, 1945 (March 30, 1944). G.M.H.

Whiteware

Cartons—pros and cons. Anon. *Pottery Gaz.*, **70** [812] 85–87 (1945).—The advantages and disadvantages of carton packaging for pottery are discussed. L.C.C.

Ceramic radio insulating materials, class L. Australian Standards Assn. Australian Standard Specification, No. (E) C503 (1943); abstracted in *Trans. Brit. Ceram. Soc.*, **43** [5] 64A (1944).—The American war standard for ceramic radio insulating materials (ASA C75 1-1943) has been adopted. See "Second . . .," *Ceram. Abs.*, **23** [4] 74 (1944).

Dangers of infection from cracked crockery. Sydney Linfoot. *Pottery Gaz.*, **70** [812] 98–99 (1945).—Linfoot examined cups in use in public restaurants and cafes. Undamaged cups showed practically no live organisms. Damaged ware invariably showed free growth of organisms, including dangerous types. Dangers of transfer of diphtheria, stomatitis, typhoid, and syphilis are discussed. L.C.C.

Laboratory porcelain. Anon. *Pottery Gaz.*, **70** [814] 218–20 (1945).—The industry in Germany before the war is described. Postwar possibilities and developments in technical ceramics are discussed. L.C.C.

Modern engineering services as applied to the pottery industry. W. H. Reid. Presented at meeting of the Pottery Managers' and Officials' Assn.; *Pottery Gaz.*, **70** [815] 276–84 (1945). L.C.C.

Pottery management and the worker. A. E. Hewitt. Read before the National Council of the Pottery Industry; *Pottery Gaz.*, **70** [813] 149–50 (1945). L.C.C.

Pottery research. Marcus Francis. *Pottery Gaz.*, **70**

[814] 199–205 (1945).—F. describes the equipment and work of the Research Station of the British Pottery Research Assn. at Penkhull, Stoke-on-Trent. L.C.C.

Pottery trade of tomorrow. T. M. HERON. *Pottery Gaz.*, **68** [795] 485–98, 504 (1943).—H. surveys the probable effects of changed social and economic conditions on the industry and stresses the importance of quality based on a sound traditional style. He considers that there will always be room for individual craftsmanship, but that scientific control is necessary for mass-produced ware. L.C.C.

Report of White Wares Division Liaison Committee. J. R. BEAM, Past-Chairman. *Bull. Amer. Ceram. Soc.*, **24** [7] 263 (1945).

Retrospect and prospect. C. BAILEY. *Pottery Gaz.*, **68** [793] 379–82, 385 (1943).—B. suggests modernization of equipment and the institution of an adequate scheme of research, which should be collective rather than uncoordinated, with the object of achieving bulk production with quality as the keynote. He stresses the importance of art and tradition in the pottery industry. L.C.C.

Shrinkage of extruded steatite tubes. HENRY H. HAUSNER AND ANGELA F. NAPORAN. *Bull. Amer. Ceram. Soc.*, **24** [7] 246–50 (1945).—3 references, 8 figures.

South African pottery. ANON. *Pottery Gaz.*, **70** [812] 96 (1945).—Vaal Potteries, operating in the Transvaal Province, is making a wide range of household pottery from S. African materials. No decorated ware has yet been made. Sanitary ware and electrical porcelain are possible developments. A special muffle kiln for white enameled fire clay is being constructed. The fire clay is mined on the property and is of good quality. L.C.C.

Traditional and modern styles in English pottery. W. B. HONEY. *Pottery Gaz.*, **70** [816] 346–52 (1945).—H. advocates the increased manufacture of hard-paste porcelains and stresses the importance of the study of English tradition in pottery design. Views are given on the best methods of decoration of mass-produced ware. L.C.C.

White earthenware. G. S. PRELLER. *S. African Mining Eng. Jour.*, **53,** Part 2, 249 (1942); abstracted in *Trans. Brit. Ceram. Soc.*, **43** [3] 33A (1944).—Kaolin and ball clay occur in South Africa; feldspar, spodumene, and glaze constituents are also available.

SEPARATE PUBLICATIONS

Book of Pottery and Porcelain. WARREN E. COX. Crown Publishers, New York, 1944. 2 vols. 1158 pp., 3000 illustrations. Price $10.—This great definitive work on the art of ceramics has been finally brought to completion after many years of research, consultation, and study. It covers the history, technique, and development of all types of china, pottery, and porcelain in all parts of the world from the beginnings to the present day. There is a clear, authoritative, and thorough discussion of the details, qualities, nature, and distinguishing features of each type. (All authenticated marks and signatures are clearly shown in convenient ready-reference tables.) More than 2000 photographs in the text clarify the description of form, decoration, and detail, and 250 full-page plates show the most notable existing examples from public and private collections throughout the world. Ceramics, one of the oldest of arts, is probably closest to man in his everyday life, and this is the great comprehensive work on the subject. The following types are covered: Egyptian, Greek, Roman, black-figure, Etruscan, Tanagra, Mesopotamian, Persian, Han, T'ang, Five Dynasties, Sung, Korean, Yuan, Hispano Moresque, *bucchero,* faience, majolica, delft, Copenhagen, Sèvres, Ming, Ch'ing, T'zu Chou, celadon, Chelsea, Deruta, Dresden, Derby, Wedgwood, Shenandoah, Lenox, Pennsylvania Dutch, Staffordshire, soft paste, bone china, American Indian, contemporary American.

Porcelain and Other Ceramic Insulating Materials: Vol. I, Raw Materials, Manufacturing Processes, Testing, and Characteristics. ERNST ROSENTHAL. Chapman & Hall, Ltd., London, 1944. 288 pp. Price 28*s.* Reviewed in *Trans. Brit. Ceram. Soc.*, **43** [5] 70A (1944).—R. states in his preface that the book is written primarily for engineers and manufacturers who use porcelain and similar ceramic materials in their electrical or chemical plants. For this section of readers he has attempted to cover a very wide field in a relatively short treatise and has succeeded well in his presentation of the subject. This will not prevent the ceramist from being a little disappointed, however, in the elementary nature of the treatment. In view of the type of reader for which the book was written, a few minor points of criticism arise, viz., the space devoted to formulas of Seger cones with lists of squatting temperatures. Some of the compositions have undergone considerable modification both in this country and in America since Seger's original list was published. In addition, the correlation of a cone with a squatting temperature is a misleading indication since the figure obtained for short-term muffle-kiln firing has no relation to industrial kiln behavior. Industrial pyrometry, on the other hand, is covered in a single page. Although the book is intended for the reader who is not highly technical, there are extensive quotations from recent technical research papers, especially in the section on high-frequency insulators. Some of these papers do not indicate the standard of present-day knowledge of ceramic manufacturers on the products concerned. The section on grinding is not very indicative of modern practice. As small points, one may mention the consistent use of the word "arc" instead of "ark" for a mixing or storage vessel, talcum for the customary talc, deflocculent for deflocculant, and lastly on p. 166 the statement that as an alternative to pressure filter presses the water can be removed from (clay) slip by means of vacuum chambers. Since the consolidation of clay in the press requires a pressure of the order of 100 lb. per sq. in., the error is obvious. There are relatively few typographical errors, and the quality of paper and the printing are excellent.

Survey of the Suitability of Domestic Talcs for High-Frequency Insulators. THERON A. KLINEFELTER, SIDNEY SPEIL, AND SIDNEY GOTTLIEB. *U. S. Bur. Mines Rept. Investigations,* **3804,** 58 pp. (1945). Free.—The results of a survey to find new domestic sources and expand known deposits of talc suitable for making steatite radio and electronic equipment for the Army and Navy are described. The work was undertaken in cooperation with the Geological Survey and was completed about two years ago, but the results could not be published because of security reasons. The survey proved that the U. S. has adequate reserves of talc for steatite insulators without depending upon imports or using lower grades of domestic talc. Field and laboratory testing methods are described in detail with results in tabular form. R.A.H.

PATENTS

High dielectric constant ceramics. EUGENE WAINER AND A. N. SALOMON (Titanium Alloy Mfg. Co.). U. S. 2,377,910, June 12, 1945 (June 2, 1943). 12 claims. Cl. 106-39.—1. A dielectric material comprising barium titanate in major amount and a fluoride of a metal of group II in minor amount.

Production of ceramic spark-gap insulators. ROBERT BOSCH G.M.B.H. (Emil Klingler, inventor). Ger. 741,142, Nov. 5, 1943 (April 2, 1941); cl. 80*b*; abstracted in *Chem. Zentr.*, **1944, I** [15] 885.—The starting material for the spark-gap insulators is alumina which has been made by the wet process and then melted in the electric arc, preferably at temperatures above 2000°C. The melt is quenched before milling. Example for the composition of a batch: at least 75% by weight alumina and the remainder additions of fluxes containing silicic acid and alkaline-earth oxides. M.HA.

Spark plug. PAUL R. MENA. Can. 426,470, April 3, 1945 (March 12, 1943). CHESTER CIPRIANO. Can. 426,-619, April 10, 1945 (June 16, 1943; in U. S. June 16, 1942). D. HENRY STOLTENBERG. Can. 426,652, April 10, 1945 (Aug. 23, 1943; in U. S. Dec. 19, 1942). G.M.H.

Spark plug. LODGE PLUGS, LTD., AND B. HOPPS. Brit. 569,237, May 24, 1945 (Nov. 6, 1943).

Tiled wall facing. A. M. BURDON-COOPER. Can. 425,-765, Feb. 27, 1945 (July 2, 1943). G.M.H.

Equipment and Apparatus

Artificial drying. P. THOR. *Tonind.-Ztg.*, **66**, 322 (1942); abstracted in *Trans. Brit. Ceram. Soc.*, **43** [2] 20A (1944).—Commenting on an article by W. Schnell ("Tunnel drier," *Ceram. Abs.*, **24** [4] 77 (1945)), T. advances the merits of chamber driers against those of tunnels. According to figures given, the former are much more economical of space and entail a smaller capital outlay. Maintenance costs are also less. Schnell's claim to exhaust air at 100% saturation is strongly criticized. The operation of a (patented) drier working on the three-chamber system is described, and the amount of water removed by a given weight of air is stated to be double that in Schnell's tunnel drier. **Discussion.** W. SCHNELL.—S. states that his article was not written to advance the claims of any particular drier. Since those processes are most satisfactory which are least dependent on the human element, a tunnel drier with no valves, etc., to control is preferable to a chamber drier. Schnell considers that the three-chamber system described by Thor is but a modification of the tunnel drier. The calculations of space and cost and the objections to working with saturated exhaust air are contested. See "Practical . . ., *ibid.*, **24** [7] 128 (1945); "Tunnel. . .," this issue, p. 149.

Barrier-layer photoelectric cells for temperature measurement. T. LAND. *Jour. Iron & Steel Inst.*, **149** [1] 481–511P, 558–83P (1944).—The selenium barrier-layer photoelectric cell has many advantages for temperature measurement, now that more is known of its limitations and calibration. Ten cells were investigated, and their fatigue, temperature coefficients, and departure from linear response were determined. Theoretical investigation shows the relation of the calibration to the spectral sensitivity and the correction that must be applied when a tungsten lamp is used as a temperature standard. Nine of the ten cells tested proved satisfactory. The design of the optical system and its effect on the calibration of the pyrometer were studied theoretically and experimentally, and a basis for the design and calibration of pyrometers was laid down. 16 references, 15 illustrations. A.B.

Coating for wire-wound resistors. ANON. *Bull. Amer. Ceram. Soc.*, **24** [7] 252 (1945).

Determining Vickers hardness numbers by indentation depth. H. V. WEINGRAEBER. *Metallwirtschaft*, **22**, 163–65 (1943); *Ind. Diamond Rev.*, **5** [54] 100–101 (1945).—The problem of determining the Vickers hardness by means of indentation depth, i.e., the use of Rockwell-type machines equipped with Vickers indenters, was studied, and W. considers this method useful only for Rockwell-type machines equipped with gauges of an accuracy higher than hitherto usual. A mathematical treatment of the problem is given. 5 references, 3 figs. P.G.

Drift of selenium photoelectric cells in relation to their use in temperature measurement. J. A. HALL. *Jour. Iron & Steel Inst.*, **149** [1] 547–57P, 558–83P (1944).—H. describes experiments made to investigate the "drift" effect in selenium barrier-layer photoelectric cells to be used for temperature measurement. The drift of 7 of the 9 cells examined was too great to permit their use for the most accurate work. A comparison with work done by Land ("Barrier . . .," this page), however, showed that his cells were, on the average, more satisfactory and that, by pooling the two batches, 11 satisfactory cells could be obtained from a total of 19. The following characteristics of the drift effect were noted. The drift, expressed as a percentage, is independent of the current given by the cell and hence of the brightness to which the cell is exposed. If a cell is allowed to drift by exposure to radiation from a source at a given temperature and the temperature is then increased, the initial response to the higher temperature is almost, but not quite, as great as if the cell had not previously drifted at the lower temperature. Drift is much reduced when deep-red and infrared radiation is excluded. Among the filters examined, a 0.25-in. thickness of Calorex glass was sufficient to obtain the maximum observed reduction in drift (about 50%). No drift was observed when the cell was exposed on open circuit. If the illumination of a cell is interrupted for a short period and then resumed, the sensitivity of the cell recovers somewhat during the rest period but rapidly resumes the value it had just before, irrespective of whether it had previously been allowed to drift for a long or a short period. The speed of recovery depended to some extent on the circuit conditions under which the cell was allowed to recover and was most rapid when the cell was short-circuited.

Flint grinding pebble production. W. E. TRAUFFER. *Pit and Quarry*, **36** [10] 68 (1944); abstracted in *Mine and Quarry Eng.*, **9** [10] 258–59 (1944).—Since 1939 there has been increased production of flint grinding pebbles and mill liners in the U. S. to replace supplies formerly imported from Europe. An important deposit near Baraboo, Wis., consists of sedimentary sandstone metamorphosed into quartzite, containing an average of 98.9% silica and having a hardness of 7 (Mohs' scale). The broken rock is crushed and graded. The 1.5- to 3.5-in. product is fed to a ball mill, which produces the finished pebbles. Undersize material is sold as graded grits. Mill liners are made in granite quarries near Montello. It is claimed that this liner-pebble combination is more efficient than one made up of imported stones. The quartzite pebbles grind white, and there is therefore no color contamination. L.C.C.

Indentation hardness of diamond. ANON. *Ind. Diamond Rev.*, **5** [54] 103 (1945).—The indentation hardness of diamond has been determined by the National Bureau of Standards using the Knoop indentation method. The indentation hardness of diamond in relation to that of boron carbide, silicon carbide, aluminum oxide, corundum, topaz, and sintered tungsten carbide is shown diagrammatically. No differences in hardness values have been found by this method on different faces of the diamond and diamonds of different findings. 2 references, 3 figs. P.G.

Many factors govern selection of abrasives for blast cleaning. D. C. TURNBULL. *Amer. Machinist*, **89** [5] 98–101 (1945).—Tables are given to aid in deciding whether to use sand, steel, shot, or grit for cleaning different materials, to determine the pressure required for the air blast, and for cost calculations for operation and maintenance. M.HA.

Measurement and control of open-hearth flame radiation intensity. A. L. HODGE. Presented at meeting of Chicago Section of National Open Hearth Committee, Iron and Steel Division, A.I.M.E.; abstracted in *Ind. Heating*, **12** [6] 988–90 (1945). M.HA.

Modern dust-off and finishing table installations for preventing and combating silicosis in the ceramic industry. S. REINECK. *Ber. Deut. Keram. Ges.*, **25** [3/4] 80–92 (1944).—The following stages in the production of ceramics are dust forming: (1) preparation of sagger: crushing, conveying, screening, filling bins, etc.; (2) preparation of body: potsherd grinding, dry grinding of clay, stamping machinery, and charging of ball mills; (3) mold casting: handling and filling of molds; (4) throwing: cutting away the dry edges of plate and dish molds; (5) crude polishing: dressing, edge cutting, and trimming of dry green ware, pressed articles, and insulators; (6) kiln room: discharging kilns; (7) glazing shop: glazing and spraying of bisque. Modern equipment for preventing and eliminating dust at all these stages of production is described. M.HO.

Operating experiences with chamber driers. F. SCHOLZ. *Tonind.-Ztg.*, **66**, 306 (1942); abstracted in *Trans. Brit. Ceram. Soc.*, **43** [2] 20A (1944).—Developments in drying procedure have frequently ignored principles known since the early days of artificial driers. An estimate of the heat used in a Keller drier of the original type compares favorably with a similar estimate for a more modern installation with air introduced at the bottom and exhausted from the roof (there is, however, some doubt as to the accuracy of these and other calculations in this paper). The air and heat requirements of modern chamber driers, including those working on the double-circuit system, at different stages of the drying process and under different external

atmospheric conditions show that very close control is necessary if the drying is to be conducted economically. Early driers worked under a certain excess pressure and with no through passage of air. Driers are now being run with air under pressure rather than suction and with higher exhaust temperature.

Principle, application, and development of oxygen cutting. R. E. DORÉ. *Proc. S. Wales Inst. Engrs.*, **60** [2] 72–134 (1944).—This paper amounts to a handbook on the subject. The history begins in 1885 in Warrington, England, but the industrial applications were not pursued until the present century. About 3.5 cu. ft. of pure O_2 is needed to oxidize 1 lb. of iron, less than the theoretical amount because not all the metal removed by the cut is oxidized. The properties of the fuel gases are listed. The O_2 must be pure, and 99.5% is the standard. The various types of blowpipe (hand, portable, and "stationary") are illustrated and described. Cutting techniques are dealt with at length, especially the difficult heavy cuts (8 in.). The cutting of cast iron, underwater cutting, the appearance of the cut surfaces, and the metallurgical changes are fully described and illustrated. C, Mn, Cr, Ni, P, S, and V steels can be cut. Various industrial applications are described, such as scrap cutting, flame gouging, underwater cutting, mechanical cutting, stack cutting, and steel deseaming. A short section is devoted to future developments. L.R.B.

Quartz lapping machine. ANON. *Ind. Diamond Rev.*, **5** [55] 135 (1945).—A standard bench drilling machine has been adapted for lapping quartz plates by providing an eccentric driving pin moving the sheet metal work holder. The bottom lap is fixed to the work table; the upper lap is removable, and its rotation is prevented. It is produced by Jones & Shipman, Ltd., Leicester. P.G.

Rotary kiln. T. WATERFALL. *Cement, Lime, & Gravel*, **19** [10] 343–47 (1945).—W. gives a history of the development and design of rotary kilns and discusses modern practice. Illustrated. E.R.V.

Suitability of oils for wet-pressing of electroceramic insulators. A. UNGEWISS. *Ber. Deut. Keram. Ges.*, **25** [3/4] 42–60 (1944).—In the wet-pressing of ceramic insulators, oil is added to the mixing water to facilitate the removal of the pressed body from the press. This is particularly important where the pressed article has a complex shape. The composition of the oil, being regarded as a trade secret, is not divulged by the oil producers. Furthermore, because of war conditions, shipments of oil, even from the same purveyor, are not always uniform. The behavior of an oil as lubricant in wet-pressing and its effect on the dry strength of the pressed article are of paramount importance for the ceramist. For this reason the present investigation was undertaken. Thirteen samples of representative oils used in wet-pressing were studied, first for specific gravity, Engler viscosity, and saponification number. The average specific gravity was 0.85 to 0.90. Most of the investigated oils have an Engler viscosity of 1.5°, but some were as high as 5.2°E. The specific gravity, viscosity, and saponification number showed no correlation. While these indices may be used to check the uniformity of different shipments, they are not indicative of the suitability of an oil for wet-pressing. The next set of experiments concerned the behavior of the oils in a ceramic body. Two series of experiments were carried out; one dealt with the effect of the oils on the dry transverse strength and the other with the pull-off force, i.e., the force required to push the molded specimen out of the mold. The same ceramic body was used for all experiments: clay 55, feldspar 25, and quartz 20%. Its composition was washed Kemmlitz-O-kaolin 43.0, Lieskau clay 7.5, Wildstein whiteware clay 14.2, ground Ströbel spar 28.0, and ground Norwegian feldspar 7.3%. The dry mix was ground in an Alsing cylinder with an equal weight of water to a fineness of 0.8% residue on a 6400-mesh screen. The ground mix was dried and dry-ground to pass a 49-mesh per sq. cm. screen. Test pieces were made by mixing the above mix with 25% of H_2O and 5% of an oil. The dry transverse strength of a control specimen (made with H_2O but omitting the oil) was 2.4 kg. per sq. cm. The test specimens containing oil ranged from 1.18 to 1.45 kg. per sq. cm. Thus, all the tested oil lowered the dry strength of the test pieces, but there was no correlation between this lowering and the physical properties of the oils. The pull-off force was tested with a specially designed apparatus which is described in detail. In these tests, the same mix was used as in the preceding tests. The pull-off force for the bodies containing various oils ranged from 243 to 432 gm. per sq. cm., but again there was no correlation between these values and the physical properties of the oils (such as specific gravity, viscosity, and saponification number). In all of the foregoing experiments the ratio of oil to H_2O was 1:5. Experiments were carried out to determine the most propitious ratio. To this end bodies were made up, taking 100 gm. of dry mix in each case and using 2.5, 3.5, 5, 6.5, and 8 gm. of oil and 27.5, 26.5, 25.0, 23.5, and 22 gm. of H_2O, respectively. In addition, one body was made with H_2O only (26.5 gm.) and one with oil only (28.5 gm.). The pull-off force required when only H_2O was used was 420 gm. per sq. cm. With the exception of 3 oils, all the tested oils when used alone in a ceramic body required more force to pull off. The least force was required when the oil-water ratio was 1:5. It follows that the most indicative test for the suitability of oils for wet-pressing is the pull-off force, and the most suitable oil for wet-pressing is one which, when added in small quantities, reduces the pull-off force at a maximum and which effects this reduction when quantities lying on either side of the optimum are used. Finally, since electrolytes are likely to find their way into a ceramic body, tests were made to determine their effect on the pull-off force. For this purpose, bodies were made to which was added 0.1% of a 1 *N* KOH solution. In all cases but one, the presence of the electrolyte raised the required pull-off force. All the data are tabulated and presented graphically. M.Ho.

Testing hardened and tempered components. ANON. *Fertigungstechnik*, **1/77**, 122–23 (1943); *Ind. Diamond Rev.*, **5** [54] 102 (1945).—Recommendations published by the German Ministry for Armament and Munitions concerning Vickers, Rockwell-C, Shore (rebound method), and filing hardness tests are described. Instructions are issued with regard to when and in what cases a particular test should be used. P.G.

Transfer strain gauge for large strains. MARTIN GREENSPAN AND LEROY R. SWEETMAN. *Jour. Research Nat. Bur. Standards*, **34** [6] 595–97 (1945); RP 1658. Price 5¢ from Supt. of Documents, Washington, D. C.—A simple strain gauge, suitable for the measurement of strains of −16 to +32% on a 1.5-in. gauge length, is described. 4 figs. R.A.H.

Tunnel drier. R. SCHRAMM. *Tonind.-Ztg.*, **66**, 352 (1942); abstracted in *Trans. Brit. Ceram. Soc.*, **43** [2] 21A (1944).—The paper on tunnel driers by Schnell (*Ceram. Abs.*, **24** [4] 77 (1945)) is completed. The drier is divided into three equal zones, the first zone being equipped with a small number of ribbed pipes. The second is a warm zone, and the third is a hot zone. A mixing chamber runs through the drier bottom diagonally to the length of the covered tunnel. The mixing chamber has a fan which circulates the air into the drying chamber. A fan draws off the saturated air from the stagnant zone. With eight tunnels, 24,000 Dutch tile are dried in 24 hr., and with two tunnels, 6000 to 8000 hollow brick are dried. Shift work is essential in the drier, and good results can be attained only when the total heat in all three zones and the air moisture in the first zone can be kept constant.

PATENTS

Clay dispersion velocity control. R. B. BOOTH AND M. W. SAVAGE (American Cyanamid Co.). Can. 425,929, March 6, 1945 (July 28, 1943; in U. S. Sept. 17, 1942). G.M.H.

Concentrating minerals. L. J. ERCK (Minerals Beneficiation, Inc.). U. S. 2,378,356, June 12, 1945 (Feb. 11, 1942). 9 claims. Cl. 241-20. U. S. 2,378,357, June 12, 1945 (Dec. 27, 1943). 7 claims. Cl. 209-173.

Electric arc furnace. RAOUL NISSIM. Can. 425,163, Jan. 23, 1945 (April 16, 1943; in Great Britain May 22, 1942). G.M.H.

Electron tube. ALBERT BOUWERS (N. V. Philips' Gloeilampenfabrieken). Can. 427,408, May 8, 1945 (Jan. 14, 1936). G.M.H.

Electronic tube. W. W. EITEL AND J. A. MCCULLOUGH (Eitel-McCullough, Inc.). Can. 427,377, May 8, 1945 (March 16, 1943). G.M.H.

Mass spectrometry. R. V. LANGMUIR (Consolidated Engineering Corp.). U. S. 2,378,936, June 26, 1945 (July 15, 1943). 4 claims. Cl. 73-18.—1. In a mass spectrometer provided with an analyzer, in which a heterogeneous mixture of ions of different specific charge is projected as a beam by an electrical potential and separated into a plurality of beams of ions, each of the separated beams being composed of ions of the same specific mass, an ion collector and a beam sweeper for sweeping the plurality of ion beams successively over and in contact with the collector by causing the potential to decay gradually, the combination which comprises a recording galvanometer for recording separately a series of currents collected from the successive beams and a mass indicator operatively associated with the beam sweeper for indicating, simultaneously with the recording of each current, the specific mass of the ions from which that current was derived.

Mass spectrometry. H. W. WASHBURN (Consolidated Engineering Corp.). U. S. 2,378,962, June 26, 1945 (Dec. 9, 1943). 16 claims. Cl. 73-18.

Method and apparatus for producing bonded structures. J. F. HARKOM (Minister of Mines & Resources, Canada). Can. 419,700, April 18, 1944 but withheld from publication until Feb. 20, 1945 (Dec. 7, 1942).—An apparatus for forming bonded structures comprises an open-top tank, which can be closed by a diaphragm, containing a readily flowable solid granular material in which electrical heating elements are embedded, adapted to receiving a structure to be bonded in the granular material and equipped with diaphragmatic means of exerting pressure on the granular material. G.M.H.

Particle-size determination. P. R. KALISCHER (Westinghouse Electric Corp.). U. S. 2,379,158, June 26, 1945 (Feb. 3, 1943). 5 claims. Cl. 88-14.—1. In an apparatus for determining the particle-size characteristics of a powdered material, in combination, a relatively small storage receptacle for receiving a dispersed quantity of the powdered material in a dispersing medium, a settling column adapted to receive dispersing medium therein, means connecting the storage receptacle with one end of the settling column to provide for the admission of the dispersed material in the dispersing medium to one end of the column at a predetermined rate, a light source, and a light-sensitive device disposed about the settling column to indicate the relative light transmission through a cross-sectional portion of the column, the column being transparent at this point, the light source and light-sensitive device being disposed at a sufficient distance from the admission end of the column so that the admitted particles of the powdered material, under the influence of settling forces, undergo a relative gradation resulting in closely similar sized particles being present in any cross-sectional volume of dispersing medium in the settling column when the particles settle past the portion through which light from the light source passes.

Preparation of cement raw materials by controlling the composition of the mixture by electrostatic separation of certain constituents of the mixture from the crushed raw material. VOGEL-JÖRGENSEN. Ger. 741,283, Nov. 18, 1943 (March 31, 1940); cl. 1*b*; abstracted in *Chem. Zentr.*, **1944, I** [15] 885.—The raw material, which contains one constituent in excess, is ground in a mill with as quickly as possible rotating grinding bodies whereby the mill operates together with an air current in such manner that the part of the ground material not returned to the mill contains the constituent in excess in the form of free small grains. This part of the material is then freed of the finest particles in a second air separator and passes through an electrostatic separator where the free excess grains are removed. The electrostatic separator receives a material of uniform grain size free of dust so that a very efficient separation is obtained. M.HA.

Pressing apparatus for shaping clay and method of operation. W. J. MILLER (Miller Pottery Engineering Co.). U. S. 2,379,737, July 3, 1945 (May 3, 1938). 29 claims. Cl. 25-27.—4. In a batting machine, a movably mounted batting head, a mold, and a support therefor, the support comprising a body of shock absorbent material shaped to form a mold-receiving socket, the base of which cushions the mold and the wall of which centers and supports the mold against angular displacement. 11. The method of externally reinforcing a plaster dinnerware mold while clay is shaped on the molding surface thereof which comprises inserting the mold into a cavity formed in a body of resilient material and then, incident to the shaping operation, contracting the wall of the cavity around the outside of the mold to grip and support it by pressing the mold against the bottom of the cavity.

Rotary kiln. R. C. BUEHL (Plastic Metals, Inc.). Can. 427,684, May 22, 1945 (May 26, 1943; in U. S. Feb. 3, 1943). G.M.H.

X-ray tube. R. R. MATCHLETT (Matchlett Laboratories, Inc.). Can. 425,980, March 6, 1945 (Nov. 6, 1942; in U. S. Jan. 26, 1942). C. M. SLACK (Canadian Westinghouse Co., Ltd.). Can. 426,852, April 17, 1945 (May 21, 1941; in U. S. May 25, 1940). G.M.H.

Kilns, Furnaces, Fuels, and Combustion

Automatic temperature control. ANON. *Eng. & Boiler House Rev.*, **59** [1] 7–11; [2] 34–39 (1945).—Principles and theories involved in controlling temperature and the methods and instruments used are explained at length. A classification of control characteristics and a list of terms used in controller adjustment are added. M.HA.

Auxiliary service devices for industrial furnaces. A. WEBER. *Metallwirtschaft*, **23** [9–13] 102–106 (1944).—The importance of easily operated and correctly arranged auxiliary devices for the economy of furnace operation is stressed, and mechanical drives for door moving, lifting of roofs and covers, charging cars, conveyers, and automatic charging devices are described and illustrated. M.HA.

Chamber or tunnel kiln as reflected in the patent literature. ANON. *Tonind.-Ztg.*, **66**, 327 (1942); abstracted in *Trans. Brit. Ceram. Soc.*, **43** [3] 35A (1944).—The German patent literature on the tunnel kiln from 1877 to the present time is briefly reviewed; certain constructional details are illustrated.

Combustion in suspension. S. TRAUSTEL. *Feuerungstechnik*, **29**, 1, 25, 49 (1941); abstracted in *Trans. Brit. Ceram. Soc.*, **43** [2] 22A (1944).—The combustion of coal particles suspended in air is exhaustively considered from the standpoint of the mathematics of the problem, and formulas are derived for the calculation of the burning time. Guiding principles indicate the future development of methods for the estimation of reactivity.

Continuous determination of oxygen and combustibles in flue gas. JOHN F. LUHRS. Presented at meeting of the Association of Iron and Steel Engineers, Pittsburgh, Sept., 1944; abstracted in *Ind. Heating*, **12** [6] 978–80 (1945). M.HA.

Draft specifications for acid-bearing stacks. ANON. *Tonind.-Ztg.*, **66**, 332 (1942); abstracted in *Trans. Brit. Ceram. Soc.*, **43** [2] 23A (1944).—DIN 1058 (not yet in force) deals with stacks which are liable to attack by acid condensates from flue gases. Section 1, draft 1*b* ("Calculations and Types of Structure") divides stacks into four "danger groups" according to the temperature and nature

of the flue gases and recommends an appropriate structural plan for each group. DIN 1056 remains in force with regard to stability factors. The method of calculating thermal stresses is indicated. Section 2, draft 1 ("Constructional Procedure") is in 4 parts: Part I, "Finish and Equipment of Stacks," deals in general terms with gas velocity, foundations, masonry, setting of acid-resistant linings, removing of condensate, metalwork of stacks, etc.; Part II, "Building Materials," specifies limits for some properties of the brick and lays down general rules for the selection of protective coatings, mortars, and cements; Part III, "Building Practice," includes paragraphs on thickness of joints and protective coatings. Measures to be taken against the possibility of accidents are briefly reviewed in Part IV.

Fluorine in coal: I, Microanalytical determination of fluorine; II, Determination of fluorine in coal; III, Manner of occurrence of fluorine in coal; IV, Industrial significance of fluorine in coal in steam raising, gas making, and brewing. H. E. CROSSLEY. *Jour. Soc. Chem. Ind.* [London], **63** [9] 280–88; [10] 289–92; [11] 342–47 (1944).—In 1934 C. reported that F in coal etched glass bottles in annealing kilns. In the same year Lessing stated that severe corrosion of the porcelain fillings in gasworks scrubbers was occasioned by F in coal. The etching could be matched when coals containing less than 100 parts per million of F were used. A satisfactory method of F determination in coals was worked out, and many British coals were examined. In most cases the F content did not exceed 80 p.p.m. but occasionally rose to over 120 p.p.m. The etching occurred with coals containing 85 to 130 p.p.m., and the corrosion of the porcelain filling with coals containing 120 to 130 p.p.m. The F was found to originate in calcium fluorapatite in the coal, so that if more than 0.05% P is found the coal is suspect. Cleaning reduces the F content, since the roof and floor shale contains more than the coal. In boiler furnaces, the F is wholly evolved as HF or SiF_4, which could attack the siliceous refractory lining or metal parts. In coal-gas manufacture the F is liberated by steaming and should be present in the liquor. In beer, 1 p.p.m. of F introduced in the malt (which comes in contact with combustion gases), may be deleterious. L.R.B.

Fuel ashes in industrial firing plants. A. ZINZEN. *Forsch. Gebiete Ingenieurw.*, **14** [4] 89–104 (1943).—The increasing use of fuels rich in ash content made it necessary to judge the behavior of a coal on the basis of chemical analysis and fusion point of the ash. The mineral systems of importance for fuel ashes are SiO_2–Al_2O_3, $CaSO_4$–CaO, fire clay–gypsum, fire clay–iron oxide, and fire clay–iron oxide–gypsum; reactions and behavior of the combustion products with respect to these systems are explained, and a general fusion diagram is developed by which all nonalkaline ashes of bituminous coals and lignites can be classified and from which the sintering behavior of an ash can be derived. Practical conclusions are drawn for the application of the diagrams to boiler and combustion plants. 26 references. M.HA.

Fuel economy a necessity. ANON. *Brit. Clayworker*, **54** [636] 6–7 (1945).—Shortage of good fuel and various restrictions on its use make fuel economy an important matter. Many brickmakers use at least twice the necessary amount of coal in good continuous kilns through ignorance of proper firing conditions and scientific management. Coke and peat may be used to some extent to replace coal, but although peat alone can fire excellent brick, the cost of carriage is usually excessive. L.C.C.

Method for the calculation of flame temperatures, enthalpy, and entropy of combustion gases. MANFRED RITTER VON STEIN. *Forsch. Gebiete Ingenieurw.*, **14** [5] 113–23 (1943).—The complete theory is developed; a calculation is possible only if the state of dissociation of the gases is known. M.HA.

Mineral wealth in the Arctic wastes. ANON. *Gas World*, **122** [3156] 92–93 (1945).—Vast new mineral resources have recently been discovered in the Komi republic of the U.S.S.R. The Pechora coal basin contains coal of all grades, almost equal in extent to the Donetz basin, as well as iron ore, gypsum, refractory clay, salt, and mineral dyes. In the Kizel basin 50 new coal mines have been started during World War II. Eight mines have been started in the Chelyabinsk basin, and others are about to be opened near Sverdlovsk in the heart of the Urals. Oil, sulfur, and phosphorites have been found in Khirgizia. Coking coal is also being worked; 2.6 million cu. yd. of natural gas at 80 atm. is yielded by 4 gas wells in the Saratov area, which is piped to Moscow. Great reserves are available. L.R.B.

New automatic stoker. ANON. *Brit. Clayworker*, **54** [636] 9 (1945).—This smokeless stoker has been successfully used for frit kilns and on a pottery earthenware updraft biscuit oven. A special device has been added for intermittent oven use. Advantages include a fuel saving of 20 to 40% and less wear and tear on fire-chamber linings. L.C.C.

Pottery firing. P. BAILEY. Address and discussion at a meeting of the Pottery Managers' and Officials' Assn.; *Pottery Gaz.*, **70** [813] 153–60 (1945). L.C.C.

Pulverized and liquid fuel burning. C. H. MARKS. *Eng. & Boiler House Rev.*, **59** [4] 90–93 (1945).—In a discussion on the fuels that may become important in the future, the advantages and disadvantages of pulverized coal and liquid fuels are compared with those of straight-mine coal. The turbulent burner for pulverized coal gives excellent combustion conditions, releasing up to 35,000 B.t.u./cu. ft./hr., but water-cooled furnace walls are required on a slagging type of furnace. Liquid fuels depend on proper atomization and also require a turbulent burner for best combustion. M.HA.

Recent developments in intermittent oven firing technique. A. DINSDALE AND MARCUS FRANCIS. *Trans. Brit. Ceram. Soc.*, **44** [1] 1–20 (1945).—In interpreting the available data, both those supplied by manufacturers and those experimentally determined during full-scale investigations, it is necessary to keep in mind certain considerations that have a bearing on the extent to which conclusions may reasonably be drawn: (1) A mechanical feed has no other function than that of ensuring a steady and controllable delivery of coal to the fuel bed. Provided that this function is adequately fulfilled, the particular design of the stoker has no bearing on the extent to which economy may be achieved. (2) Since the incorporation of the principle of continuous feeding will involve modifications in firemouth design and in firing technique, consideration must be given to the possible effects which these changes might have had without the mechanical stokers. (3) Experience supports the view that very few, if any, ovens in the industry are being fired to the maximum efficiency. In many cases, if the management were to spend time on the question and supervise a firing throughout, the result would doubtless be a recognizable saving in fuel. With these reservations in mind it may be concluded that, although much remains to be done in perfecting the design of both stokers and fire mouth, recent work on the problem of firing has resulted in considerable progress toward economy in fuel consumption. The interest shown in the problem has added much to the knowledge of oven firing practice. R.A.H.

Saving coal. ANON. *Brit. Clayworker*, **54** [636] 7–8 (1945).—The high cost of coal will probably continue, and economy should be seriously studied by clayworkers. All possible causes of loss of fuel or waste of heat must be sought out, and means must be found of avoiding or reducing them. Steam pipes should be covered, flues cleaned regularly, scale avoided by proper treatment, and air leakages sealed. For the latter, a filling of clay and brick dust is effective, especially if finished off with Portland cement + sand + waterproofing agent. Excessive access of air caused by porous brickwork may be reduced by a coating of washable distemper or similar material. L.C.C.

SEPARATE PUBLICATIONS

Analyses of Tennessee Coals (Including Georgia). ANON. *U. S. Bur. Mines Tech. Paper*, **671**, 243 pp., (1945). 3 figs. Supt. of Documents, Washington, D. C. —The principal facts regarding the occurrence, reserves,

quality, characteristics, production, and uses of coals of each of the two states are presented. R.A.H.

Rapid Method for Determining Surface Moisture in Coal. L. D. SCHMIDT AND WILLIAM SEYMOUR. *U. S. Bur. Mines Rept. Investigations*, **3811,** 11 pp. (1945). 10 figs. Free.—A measured sample of coal is placed in a solvent such as alcohol, and the surface moisture is dissolved. The solvent is then filtered from the coal, and its moisture content is determined by measuring the dilution of the solvent by its change in specific gravity. R.A.H.

PATENTS

Air distribution to burners. THEODORE KRUGER (Combustion Engineering Co., Inc.). U. S. 2,379,490, July 3, 1945 (Feb. 21, 1942). 3 claims. Cl. 110-104.—1. In a pulverized fuel burner, a windbox, a fuel injector pipe projecting horizontally through the windbox.

Firing of ceramic ware. ROBERT BOSCH G.M.B.H. (Emil Klingler, inventor). Ger. 736,311, July 28, 1943 (Jan. 22, 1939); cl. 80*b*; abstracted in *Chem. Zentr.*, **1944, I** [2] 118.—The material, especially used for spark plugs, has a preponderant Al_2O_3 content, and is brought, after hard firing, to below 1000°C. (but not rapidly enough to injure the material), preferably to between 900° and 1000°, and then cooled from this temperature with reduced cooling velocity. The high cooling velocity is to prevent a recrystallization of the alumina (formation of large alumina crystals) so that the mechanical strength and the resistance to changing temperatures of the ceramic body are increased. M.HA.

Tunnel furnaces or kilns of the continuous type. C. S. SHAPLEY, D. C. GUNN, AND A. HIGGS. Brit. 569,491, June 6, 1945 (June 19, 1943).

Geology

Banalsite, a new barium feldspar from Wales. W. CAMPBELL SMITH, F. A. BANNISTER, AND M. H. HEY. *Mineralog. Mag.*, **27** [186] 33–46 (1944).—A new barium feldspar, $BaNa_2Al_4Si_4O_{16}$, named after its formula "banalsite," has been found in manganese ore from the Benallt mine in the Lleyn Peninsula, north Wales. It is orthorhombic. The space group is either *Iba* or *Ibam*, with cell dimensions *a* 8.50, *b* 9.97, *c* 16.73 a.u. Density, corrected for included water and *in vacuo*, is 3.065. Optical orientation and optic axial angle were $\alpha = c$, $\beta = a$, $\gamma = b$. $2V = 41° \pm 3°$ positive. Indices of refraction at 16° to 17°C. were α 1.5695, β 1.5710, and γ 1.5775, all ± 0.0005. The microchemical composition, after careful purification from alleghanyite, tephroite, and calcite, confirmed the above formula with some replacements. The X-ray and microscopic evidence and the occurrence are rather minutely discussed. The order of formation of minerals in the banalsite-bearing veins was apparently alleghanyite and tephroite, jacobsite, biotite, banalsite, baryte, calcite, and finally zeolites filling the interstices. **Appendix.** A. W. GROVES.—G. contributes a brief description of the manganese ore bodies. L.R.B.

Contact deposits in an artificial silicate magma. H. INSLEY. *Jour. Wash. Acad. Sci.*, **35** [5] 156–61 (1945).—An analogy is drawn between the attack of molten glass on a fire-clay refractory and the contact action of a molten magma on its containing wall rock. A brief description is given of the glassmelting furnace and possible glass compositions as they relate to the problem. In the case of the attack of a normal soda-lime glass on fire clay, the product of reaction is invariably corundum (alpha-alumina). On vertical walls and above the metal line, corundum is the primary product of attack, but in those cases where the liquid is preserved in contact (where it has not drained away) with the refractory, a plagioclase or nephelite may crystallize out with the corundum. Use is made of unpublished Geophysical Laboratory diagrams of the Na_2O and K_2O systems with alumina and silica to explain the crystallization of corundum under conditions of glass attack. Apparently, corundum is the product of attack for alumina/silica ratios over a wide range and may crystallize out at temperatures as low as 1100°C. Some comment is made on the application of this information to the choice of refractories for glassmelting operation. The occurrence of corundum in several natural deposits is described as it relates to the problem. Analogies of varying degrees of perfection are drawn between the glass-refractory contact and the various natural deposits. Generally, the analogy is a valid one provided the effect of water on the crystallization of natural corundum is allowed for. 9 references, 4 photomicrographs, one plate. S.Z.

Crystal structure of braunite, $3Mn_2O_3 \cdot MnSiO_3$. A. BYSTRÖM AND B. MASON. *Arkiv Kemi, Mineral. Geol.*, **16B** [15] 8 pp. (1943); abstracted in *Mineralog. Abs.*, **9** [3] 44 (1944).—Braunite from three sources, including the artificial mineral, gave *a* 9.40 to 9.42 a.u., *c* 18.59 to 18.72 a.u. with $8(3Mn_2O_3 \cdot MnSiO_3)$ in the body-centered unit cell. The space group may be D_{4h}^{18} or D_{2d}^{10}. L.R.B.

Eau Claire mica fields. D. C. MCLAREN. *Can. Mining Jour.*, **66** [5] 297–99 (1945).—Muscovite mica was discovered in the Eau Claire district of Ontario in 1941 and for a time yielded about one fifth of North America's output. Production has now stopped. Many discoveries have been made, but Purdy Mica Mines, the original discovery, is the only major find of commercial size. Even in this case, only the unusually great size of the mica sheets permitted profitable production. One crystal measured 6.5 x 9.5 x 2 ft. and weighed nearly 7 tons. The mica occurs in pegmatite dikes in biotite gneiss. G.M.H.

Equipment for facilitating mechanical analysis of soils. E. P. PERRY. *Soil Sci. Soc. Amer. Proc.*, **8,** 372–73 (1943). W.R.B.

Fire clay and ganister in New Zealand. J. HENDERSON. *Dept. Sci. Ind. Research New Zealand Bull.*, No. 88 (1943); abstracted in *Trans. Brit. Ceram. Soc.*, **43** [2] 17A (1944).—The fire clays of New Zealand are fully described. Their composition, before calcination, varies from 33 to 80% SiO_2 and 9 to 39% Al_2O_3; the most aluminous clays are of the kaolin type. Siliceous materials that may be useful for brickmaking are abundant in New Zealand and are of several types. There are large amounts of quartzose schists in Otago and of quartzites in West Nelson. Other less strongly bonded quartzites occur in North Auckland. The West Nelson coal measures contain vast quantities of quartzose grit, in places strongly cemented and in places friable. In Otago quartz conglomerates, grits, and sands occur loose or silicified to tough masses with chalcedony. The beaches and sand dunes of the Dominion will yield great quantities of silica sand. The sinters of North Auckland, Hauraki, and the Rotorua-Taupo region may have value, as also may the great barren quartz lodes of Hauraki.

Kyanite from British Columbia. R. L. RUTHERFORD. *Univ. Toronto Studies, Geol. Ser.*, No. 48, pp. 102–103 (1943); abstracted in *Mineralog. Abs.*, **9** [4] 66 (1944).—Translucent blue bladed kyanite is found in crystals up to 35 mm. long in quartz matrix near Albreda (west of Jasper, Alberta). L.R.B.

Mica and its importance. D. C. MCLAREN. *Can. Mining Jour.*, **66** [5] 299–304 (1945).—General information on mica, including methods of mining, preparation for market, and uses, is given. G.M.H.

Minerals and mineral relationships of the clay minerals. CLARENCE S. ROSS. *Jour. Amer. Ceram. Soc.*, **28** [7] 173–83 (1945).—31 references.

New plant near Rosiclare producing ceramic fluorspar, zinc. W. M. AVERY. *Pit and Quarry*, **37** [12] 55–59 (1945).—The fluorspar and zinc mine and recovery plant of the Minerva Oil Co. at Cave-in-Rock, Ill., were placed in regular operation on March 1, 1944. The ore is a complex mixed fluoride sphalerite replacement in limestone with varying quantities of barite and calcite; it lies in flat

lenses in the Renault, Levias, and Fredonia formations in parallel small faults. In general, the ore bodies are of great length. They are 7 to 16 ft. high and 70 to 300 ft. wide so far as is known at this time. The absence of lead in an ore containing zinc is unusual and makes possible the production of a metallurgically superior fluorspar concentrate. A. describes the plant and its equipment, discussing in turn (*a*) loading, (*b*) drilling, (*c*) milling, and (*d*) power plant. 20 photographs. M.R.

Pegmatite crystallization. T. T. QUIRKE AND H. E. KREMERS. *Amer. Mineralogist*, **28**, 571–80 (1943).—The authors attempt to analyze the geological, physical, and chemical conditions which control precipitation and growth of pegmatite minerals. The growth and persistence of large crystals is attributed to (1) the great chemical complexity of the solutions, which reaches its climax in the last stages of magmatic differentiation; (2) the establishment of temperature gradients along the pegmatite thoroughfares, both from place to place in the thoroughfares and from them into the wall rock (the variation in these temperature gradients and in the speed of flow of solutions provides optimum conditions for replacement and crystal-growth processes); and (3) the tendency of certain crystals in suitable solutions to gain increased stability with increase in size. W.D.F.

Phosphate fixation by soil minerals; mica and related groups. A. T. PERKINS AND H. H. KING. *Soil Sci. Soc. Amer. Proc.*, **8**, 154–58 (1943).—Data are presented for phosphate fixation by several minerals of similar structure, i.e., pyrophyllite and talc; muscovite, phlogopite, and biotite of the mica group, margarite of the clintonite group; and kaolinite of the kaolinite group. These data show that phosphate fixation is related to the kind of cations in the minerals, the position of the cations in the mineral structure, and to the amount of the various cations in the mineral. Major phosphate fixation by this group of minerals seems to depend on structural or anionic aluminum (AlO_3^-), while minor amounts of phosphate fixation depend on cationic aluminum or magnesium (Al^{+++} or Mg^{++}) and possibly on the hydroxial radical (OH^-). X-ray pictures of muscovite indicate that phosphate fixation is accompanied by the spreading of the space lattice. W.R.B.

Report of Committee on Geological Surveys. H. RIES, Chairman. *Bull. Amer. Ceram. Soc.*, **24** [7] 234–45 (1945). —Bibliography and maps.

Role of iron and aluminum in the retention of phosphates by soils as indicated by the solubility of phosphorus. F. L. DAVIS. *Soil Sci. Soc. Amer. Proc.*, **8**, 167–70 (1943). —A laboratory procedure for studying the retention of phosphates by soils at equilibrium in soil–$Ca(OH)_2$–H_2O–air systems is described. The effect of additions of ferric and aluminum chlorides on the differential solubilities of added phosphates was studied. The data show that the phosphate retained by the Al-treated soil was more easily soluble than that retained by Fe-treated soil and indicate that under the conditions of these experiments the effect of iron and aluminum on the retention of phosphates by soils functions through the soil colloids. W.R.B.

Talc and soapstone industry in Canada, 1942. ANON. *Rept. Mining, Met. and Chem. Branch, Dept. Trade Commerce, Canada*, 1943; abstracted in *Trans. Brit. Ceram. Soc.*, **43** [2] 18A (1944).—The talc, soapstone, and pyrophyllite production and industry of Canada in 1942 are reported, with notes on the mines and output, statistics, particulars relating to the consumption of fuel, electricity, and power, and figures showing production, sales, and consumption of talc in Canada.

X-ray diffraction experiments on illite and bravaisite. G. NAGELSCHMIDT. *Mineralog. Mag.*, **27** [187] 59–61 (1944).—N. examined the basal spacing of illites from south Wales and Illinois and of glauconite from Surrey, England, in view of the observation of Jackson *et al.* that the spacing of Illinois illite changed when K^+ was replaced by Ca^{++}. The alteration in the American illite was confirmed, but the south Wales material did not show the effect nor did glauconite. Weathered glauconite did, however, show a spacing at 15 a.u. N. made "ordered aggregate" samples by his own method. Reasons are given for supposing that the basal spacing is 10 a.u., irrespective of the nature of the exchangeable base, the alteration in basal spacing being due to montmorillonite. Bravaisite is classed as of mixed illite-montmorillonite structure. L.R.B.

SEPARATE PUBLICATIONS

Common Rocks and Minerals of Missouri. W. D. KELLER. *Univ. Missouri Bull.*, **46** [5] (Arts Sci. Ser., No. 1) 78 pp. (Feb., 1945).—This booklet has been prepared with the intention of answering the questions most commonly asked by citizens of the State about Missouri rocks and minerals. Descriptions and photographs of Missouri rock and mineral occurrences are provided, and essential facts about the geological conditions of their formation are simply told. A determinative key is supplied so that the reader may identify and name most of the common specimens which he collects within the state (and elsewhere, also). No special determinative equipment is suggested, and only nontechnical language is employed because the chief objective is to furnish a useful, understandable, geological account of the common Missouri rocks and minerals to the average person without geological training. In fact, for the purposes of identification, no differentiation is made between mineral and rock, although the professional geologist does separate them in definition. For our purpose, a rock is an aggregate of mineral particles, but a mineral is a substance (without life) having more definite and constant properties than a rock. For those interested further, more technical and more nearly correct definitions, with explanations, are given. 55 illustrations.

Differential Thermal Analysis, Its Application to Clays and Other Aluminous Minerals. SIDNEY SPEIL, LOUIS H. BERKELHAMER, JOSEPH A. PASK, AND BEN DAVIES. *U. S. Bur. Mines Tech. Paper*, **664**, 81 pp. (1945). 35 figs. Price 20¢ from Supt. of Documents, Washington, D. C.—The applications and limitations of the thermal-analysis method for the study of various clays, bauxites, and aluminous minerals are discussed. The work was done in cooperation with the Tennessee Valley Authority, the University of Alabama, and the University of Washington. See "Applications. . .," *Ceram. Abs.*, **23** [11] 200 (1944). R.A.H.

Geological Map of Canada: I, Eastern; II, Western. Can. Dept. Mines and Resources, Bureau of Geology and Topography, 1945. Colored. Scale 60 miles to 1 in. Price unmounted 50¢ or each part 25¢. G.M.H.

Microseismic Method of Predicting Rock Failure in Underground Mining: II. LEONARD OBERT AND WILBUR DUVALL. *U. S. Bur. Mines Rept. Investigations*, **3803**, 14 pp. (1945). 11 figs. Free.—The results of a number of laboratory experiments designed to give information on the origin of microseisms and the microseismic properties of various mine rocks are presented. For Part I see *Ceram. Abs.*, **24** [6] 114 (1945). R.A.H.

Mineral Occurrences in the Renfrew Area. J. SATTERLY. *Ann. Rept. Ont. Dept. Mines*, **50**, Pt. 3 (1944); reviewed in *Can. Mining Met. Bull.*, No. 397, pp. 227–28 (1945). G.M.H.

Minerals Yearbook, 1942. U.S. BUREAU OF MINES. 1574 pp., 101 figs. Price $2.25 from Supt. of Documents, Washington, D. C.—This yearbook records the outstanding achievements of the mineral industries during one of the most critical years of the war, in which the production of many metals, fuels, and nonmetallic minerals reached unparalleled heights and proved again that mineral resources are indispensable to modern warfare and national security. Until now, this 1942 edition has been classified confidential. R.A.H.

***Mining Journal*, Annual Review Number.** London, 1945. 112 pp. Price 2*s.* 6*d.*—This review of progress, events, and developments in various metal and nonmetallic industries during 1944 comprises (1) the mineral industry, gold, silver, platinum, nickel, copper, tin, lead, zinc, cadmium, magnesium, aluminum, bauxite, oil, mercury, diamonds, coal, steel, metallurgy, and equipment; (2) Canada, South Africa, Australia, New Zealand, Nigeria,

Cornwall, China, and Orange Free State; (3) mining shares and company results. Illustrations, statistics, and index. E.R.V.

Precious and Semi-Precious Stones. M. WEINSTEIN. Sir Isaac Pitman & Sons, Ltd., London; Pitman Publishing Corp., New York, 1944. 4th revised ed. 185 + x pp., 16 plates, 4 figs. Price 10*s.* 6*d.*—A popular account of gemstones and certain ornamental stones. Appendixes, a gemstone bibliography, and an index are included. E.R.V.

Trends in Explorations of Mineral Deposits. LOWELL B. MOON. *U. S. Bur. Mines Information Circ.*, **7312**, 6 pp. (1945). Free.—In describing the methods for exploring mineral desposits, M. states that there is no best method of exploring all mineral deposits, but there is usually a best method or combination of methods for exploring any given deposit. As the higher grade and more easily accessible deposits are depleted, two trends in mining, and consequently in exploration, are developing: (1) the gathering up of the comparatively high-grade "crumbs" of ore left in small deposits and (2) the exploration and utilization of large but lower-grade or more deeply situated deposits. R.A.H.

PATENTS

Dolomite processing. W. H. MCINTIRE (American Zinc, Lead & Smelting Co.). Can. 426,977, April 24, 1945 (June 10, 1941; in U. S. Aug. 3, 1940). G.M.H.

Chemistry and Physics

Comparison of the properties of freshly precipitated and heated aluminosilicates and alumina and silica gels and of clay minerals. S. P. RAYCHAUDHURI AND N. B. DATTU. *Jour. Phys. Chem.*, **49**, 21–32 (1945).—Silicic acid and aluminum hydroxide sols were mixed in proportions corresponding to those of kaolin, beidellite, and montmorillonite. Each mixing was carried out in three different ways, viz., the addition of each to an excess of the other and dropwise mixing of the two simultaneously. Each precipitate was examined for chemical composition, electroosmotic charge, base-saturation capacity at pH 7.0, moisture content at 50% relative humidity, and buffer curve. Gels prepared from silica, alumina, montmorillonite, halloysite, kaolin, quartz, and bauxite were similarly examined. All the above gels were then heated for 12 hr. at 100°C. and again examined for physicochemical and electrical properties. All the properties of the artificial gels depend on the method of mixing used. On heating, the precipitated aluminosilicates tend to acquire the properties of the naturally occurring minerals. Dropwise mixing of colloidal solutions of aluminum hydroxide and silicic acid favors the formation of mineral structure. 15 references, 2 figs. R.A.G.

Curriculum revised at the University of Illinois. ANON. *Bull. Amer. Ceram. Soc.*, **24** [7] 270–71 (1945).

Lattice parameters of α-alumina and chromic oxide. A. H. JAY AND W. T. WILDE. *Mineralog. Mag.*, **27** [187] 56–58 (1944).—New and more accurate X-ray data for α-alumina and chromic oxide are listed. These are the relative intensities, indices, sin θ values, and spacings. The cell dimensions of α-alumina are *a* 5.1180 ± 0.0001 *kX*, α 55° 17′, and of chromic oxide *a* 5.3506 ± 0.0001 *kX*, α 55° 6′. L.R.B.

Particle-size distributions by centrifugal sedimentation. C. BROWN. *Jour. Phys. Chem.*, **48**, 246–58 (1944).—A mathematical analysis of the sedimentation of particles from suspensions by means of a beaker-type centrifuge is presented. To illustrate the method, particle-size analyses of alcoholic suspensions of $BaCO_3$ and $SrCO_3$ obtained from sedimentation data using a series of tubes filled to different levels are given. 8 references, 3 figs. R.A.G.

Photometric interpretation of X-ray diffraction patterns for quantitative estimation of minerals in clays. N. N. HELLMAN AND M. L. JACKSON. *Soil Sci. Soc. Amer. Proc.*, **8**, 135–43 (1943).—A special photometric procedure is described for the measurement and interpretation of X-ray diffraction line density which makes possible more precise quantitative estimation of minerals in clays by X-ray procedure than was formerly possible. X-ray diffraction line densities are measured by means of a specially devised microphotometer that possesses an extremely bright light source of adjustable intensity to permit the accurate measurement of high film density. It is shown on a theoretical basis that the intensity of radiation diffracted to form a line is in simple proportion to the concentration of a mineral in a mixture when the density is below a value characteristic of the film, called critical density. Above the critical film density it was found that film density becomes proportional to the logarithm of the quantity of incident X radiation. A method was developed, based on the derived constants of the X-ray film blackening curves, for computing the line density over to a "corrected density" which is proportional to the incident X radiation and to mineral concentration. Tests on synthetic mixtures of the three common soil constituents (kaolinites, montmorillonites, and hydrous micas) showed good agreement between amounts found and amounts added. W.R.B.

Rapid method for determination of alumina in a nepheline concentrate. B. N. MELENT'EV. *Compt. Rend. Acad. Sci. U.R.S.S.*, **38** [2/3] 93–95 (1943).—The quality of a nepheline concentrate used to be evaluated by its Al_2O_3 content. This involved the accepted fusion analysis in which the Al was precipitated as a hydroxyquinolate. Data accumulated over a long period by the ore-dressing plant in question showed that the mineralogical composition of the nepheline concentrate is fairly constant. Thus, the averages are approximately nepheline 85.6, feldspar 8.5, and aegirine, sphene, mica, and other minerals 6.5%. The minerals composing the nepheline concentrate can be divided into two groups: those whose density is less than 2.8 (nepheline and feldspar) and those with a density greater than 2.8 (all the other minerals). Since the chemical analysis reveals the Al_2O_3 content in both nepheline and feldspar, ascertaining the quantity of these components will indicate the Al_2O_3 content. Samples of nepheline concentrates were crushed and separated into light ($d < 2.8$) and heavy ($d > 2.8$) fractions. The separation was carried out in bromoform, using an electric laboratory centrifuge. From the weight of the light fractions and from the Al_2O_3 contents obtained by chemical analysis, a conversion coefficient was derived. Example: (*a*) Al_2O_3 content by chemical analysis 30.27%; (*b*) light fraction in concentrate 95.6%; (*c*) coefficient $b/a = 3.158$; (*d*) Al_2O_3 content by conversion 95.6/3.158 = 30.34%. The average coefficient derived from a considerable volume of data was fixed as 3.151. A statistical analysis of the results for Al_2O_3 obtained by gravity separation (centrifuging) showed an absolute mean square deviation of ±0.28% from the results obtained by chemical analysis. The absolute mean square deviation from the average is ±0.35% for determinations made by gravity separation and ±0.50% for determinations made by chemical analysis. The time required to carry out a determination by the suggested method is 1 hr. and 45 min. M.HO.

Report of Committee on Research. ARTHUR A. WELLS, Chairman. *Bull. Amer. Ceram. Soc.*, **24** [7] 253–59 (1945). —24 references.

Report of Special Committee on Glossary and Standards. L. E. BARRINGER, Chairman. *Bull. Amer. Ceram. Soc.*, **24** [7] 260–62 (1945).

Synthetic sapphires. K. W. BROWN, R. C. CHIRNSIDE, L. A. DAUNCEY, AND H. P. ROOKSBY. *G.E.C. Jour.*, **13** [2] 53–59 (1944).—In the early days of synthetic sapphire production in the Verneuil furnace, several misconceptions arose. The longitudinal splitting does not indicate a twinned structure, as has been proved by X rays; the plane of splitting is the outcome of the release of strain and is not in general a principal crystallographic plane. The optic axis and the plane of splitting lie close together but may be at any angle to the axis of the boule. X-ray

examination shows that no natural sapphires approach the perfection of structure of synthetic sapphires. Shortly before World War II began, the Swiss methods of sapphire production were studied, but before cooperation had proceeded far, communication was cut off and further developments in England were unaided. The pure alumina is made by ignition of ammonium alum. The production of boules 50 to 60 mm. in length and 20 to 25 mm. in diameter, weighing about 300 carats, requires 4 to 5 hr. Developments in Russia are noted, but no essential improvements have been made in Verneuil's method. L.R.B.

Thixotropy and ceramics. D. G. BEECH AND MARCUS FRANCIS. *Trans. Brit. Ceram. Soc.*, **44** [2] 25–30 (1945).—Thixotropy is discussed from the ceramic viewpoint, together with its principle and its importance to ceramics. R.A.H.

Titanium dioxide. S. G. TINSLEY. *Jour. Oil Colour Chem. Assn.*, **26**, 141 (1943); abstracted in *Trans. Brit. Ceram. Soc.*, **43** [2] 26A (1944).—The uses of TiO_2 in the ceramic industries are noted. The rutile form has a very high dielectric strength, the mean constant for the pure material being over 100. By sintering TiO_2 with small quantities of suitable binders, such as bentonite, a series of porcelains can be obtained with dielectric constants varying from 20 to 100. The power factor of such materials is high at low frequencies but decreases rapidly with increasing frequency until it is less than 0.0005 at 10^6 cycles. If the TiO_2 is combined with an alkaline earth, a titanate ceramic is obtained for which the power factor even at low frequencies is comparatively small. The high dielectric constant of rutile bodies persists even at frequencies as high as 10^{12} cycles, and they are therefore used for the production of condensers of small bulk for such apparatus as short-wave radio.

Viscosity and rigidity of structural suspensions. PAUL S. ROLLER AND C. KERBY STODDARD. *Jour. Phys. Chem.*, **48**, 410–25 (1944).—The changes in viscosity of structural suspensions of bentonite at varying rates of shear were examined, and an interpretation is given for the observed effects. At a high rate of shear the structure is completely decomposed, and the viscosity, hitherto decreasing with increased rate of shear, becomes constant. The structural suspension is then equivalent to a simple suspension having discrete particles. R.A.G.

X-ray pattern of low-temperature cristobalite. A. H. JAY. *Mineralog. Mag.*, **27** [187] 54–55 (1944).—Accurate X-ray data for low-temperature (α) cristobalite are presented. The samples were taken from the hot end of used open-hearth furnace roof brick. It is the experience of J. that the presence of slaggy constituents does not alter the intensities or lattice dimensions of the cristobalite. The relative intensities, sin θ values, indices, and interplanar spacings are listed to four significant figures. Tetragonal symmetry is confirmed with a 4.9615, c 6.9054 kX at 22°C. L.R.B.

SEPARATE PUBLICATIONS

Annual Reports of the Society of Chemical Industry on the Progress of Applied Chemistry: Vol. XXVIII. Society of Chemical Industry, London, 1943. 517 pp.—A review of the literature. A chapter on glass, by W. M. Hampton and R. E. Bastick, and a chapter on ceramics, refractories, and cements, by H. W. Webb, are included.

Books, Publications, and Patents of Battelle Memorial Institute, 1929–1944. Compiled by THELMA R. REINBERG. Battelle Memorial Institute, Columbus, 1945. 72 pp.—Founded to advance education, science, and industry through research and through the dissemination of technological information, Battelle has published widely in the nation's technical and scientific journals. More than eight hundred such contributions are listed. Subjects covered include the fields of organic chemistry, electrochemistry, chemical engineering, graphic arts, welding technology, applied mechanics, mineral dressing, industrial physics, ceramics, fuels, and metallurgy. Copies of the catalogue are available on written request on university or company letterhead.

PATENTS

Magnesium oxide preparation. WILHELM MOSCHEL, WILLI FORST, AND WALTER SCHMID (I. G. Farbenindustrie A.-G.). Can. 426,159, March 13, 1945 (Aug. 2, 1940). G.M.H.

Preparation of pigmentary materials. A. T. MCCORD AND H. F. SAUNDERS (Sherwin-Williams Co.). U. S. 2,379,019, June 26, 1945 (May 29, 1942). 23 claims. Cl. 106-300.—1. Method of preparing a pigmentary material, which comprises heating a mixture of γ-titanic acid and a zinc compound selected from the group consisting of zinc oxide and compounds of zinc which yield zinc oxide on heating in such proportions that for every mol of ZnO in the mixture there will be present more than one mol of TiO_2, the heating being at a temperature between about 600° and 975°C., and until, upon X-ray examination of the material, among those lines of the diffraction pattern which are due to compounds of zinc, substantially only those lines are found which are characteristic of a zinc-titanium-oxygen compound of hexagonal symmetry and of the ilmenite structure type, the mol ratio of ZnO to TiO_2 being about 1 to 1 and 1 to about 2.3 if the heating be to a temperature between 775° and 825°C., the mol ratio being 1 to more than about 2.3 if the heating be to a temperature between 775° and 975°C., and the mol ratio being 1 to more than 4 if the heating be to a temperature of between 600° and 775°C.

Removal of iron and calcium from sand for the manufacture of glass. ALFREDO LOTTI. Ital. 395,127, Jan. 8, 1942; abstracted in *Chem. Zentr.*, **1944, I** [21/22] 1213.—The sand is treated with nitric acid so that calcium nitrate is formed, which is used for agricultural purposes. The excess of the HNO_3 used is neutralized by the addition of $CaCO_3$ or CaO, whereby Fe is precipitated. A sand with 94 SiO_2, 0.04 Fe_2O_3, 1.0 Al_2O_3, and 2.0% CaO contains, after cleaning, 99 SiO_2, 0.01 Fe_2O_3, 0.5% Al_2O_3, and traces of CaO. M.HA.

Titanium oxide pigment. R. M. MCKINNEY AND H. M. STARK (Canadian Industries, Ltd.). Can. 427,526, May 15, 1945 (Jan. 3, 1940). G.M.H.

Titanium pigment. J. L. KEATS (Canadian Industries, Ltd.). Can. 427,527, May 15, 1945 (Sept. 19, 1940). G.M.H.

Treating titanium oxide pigments. R. M. MCKINNEY (E. I. du Pont de Nemours & Co.). U. S. 2,378,148, June 12, 1945 (March 1, 1941). 6 claims. Cl. 106-300.—5. A process for recovering and obtaining an improved titanium oxide pigment from the fines present in the overflow fraction from a pigment-hydroseparating system, wherein the TiO_2 pigment is dispersed in aqueous slurry suspension by means of a small amount of an alkaline deflocculating agent, which comprises coagulating the dispersed TiO_2-pigment slurry by mixing therewith a small amount of a coagulating agent comprising an acid-reacting soluble salt of a trivalent metal from the group consisting of aluminum, chromium, and iron, adjusting the pH value of the resulting mixture to 6.9 and precipitating an insoluble treating agent on the pigment by incorporating therein a sufficient quantity of barium hydroxide, and then filtering and recovering the resulting pigment product.

Zirconium compound preparation. EUGENE WAINER (Titanium Alloy Mfg. Co.). Can. 425,490, Feb. 6, 1945 (April 3, 1943). G.M.H.

Zirconium compound purification. EUGENE WAINER (Titanium Alloy Mfg. Co.). Can. 425,222, Jan. 23, 1945 (May 26, 1942). G.M.H.

Zirconium oxide processing. H. L. SNYDER, administrator of estate of D. S. HAKE, AND H. D. PRIOR. (Titanium Alloy Mfg. Co.). Can. 425,488 and 425,489, Feb. 6, 1945 (Nov. 25, 1942). G.M.H.

General

American Ceramic Society—why? C. FORREST TEFFT. *Bull. Amer. Ceram. Soc.*, **24** [7] 266–67 (1945).

Floating pumps for water removal from clay pits. ANON. *Tonind.-Ztg.*, **66,** 331 (1942); abstracted in *Trans. Brit. Ceram. Soc.*, **43** [2] 19A (1944).—Petrol or electric-driven pumps, which float on the surface of the water being drawn off, are described; the advantages of this design are noted. See "Drawing . . ," *Ceram. Abs.*, **23** [5] 97 (1944).

How to select a rust preventive. J. R. C. BOYER. *Corrosion and Material Protection*, **2** [2] 7–9 (1945).—The principles of a rust-preventive agent are discussed, the types of removable coatings are described, and a guide to the selection of a rust preventive for various purposes is added. Oils and greases must have an inhibitor to be effective as a rust preventive; straight mineral oils are not satisfactory. M.HA.

Institute of Ceramic Engineers—President's report. M. F. BEECHER. *Bull. Amer. Ceram. Soc.*, **24** [7] 272–73 (1945).

Making pottery and glassware in Asmara. ANON. *Pottery Gaz.*, **70** [813] 151 (1945).—One of several light industries in Asmara, Eritrea, is a glass factory run by three Italians. One of these, whose family has been making glassware for over 900 years, found the local material suitable and after the arrival of the British was given a permit to set up a factory. Expansion is planned. A pottery was started by an Italian in 1943. L.C.C.

"Master-key" industries. How pottery and glass affect wars. NORMAN SHELDON. *Pottery Gaz.*, **70** [811] 33–34 (1945).—Certain sections of the pottery and glass trades are included in the few specialized industries scheduled as "key industries" by Act of Parliament. The vital part played by these in the prosecution of the war is described. Scientific glassware includes radio tubes, X-ray tubes, cathode-ray tubes, radio-location equipment, bomb aimers, flasks for penicillin production, etc., and glass tubing finds many uses, e.g., for thermometer tubes, ampoules, and hypodermic syringes. Essential ceramic products of the pottery industry include laboratory porcelain and heavy stoneware equipment for chemical apparatus. L.C.C.

Rehabilitation. ANON. *Brit. Clayworker*, **54** [636] 6 (1945).—Owners of clay holes and sand and gravel pits may in the future be required by law to leave exhausted workings fit for use as agricultural or building land or for afforestation. Methods of filling will vary according to local conditions and may include overburden, boiler and kiln ashes, dustbin refuse, soil and clay from building sites, rubble from demolitions, washery settlings, and pit shale. The final cover should consist of soil. Where shallow clay deposits are worked, the overburden may be replaced and the ground cultivated almost up to the retreating clay face. This method is extensively used in Kent, where brick-making and fruit farming have gone hand in hand for generations. L.C.C.

Report of Committee on Public Relations. V. V. KELSEY, Chairman. *Bull. Amer. Ceram. Soc.*, **24** [7] 262 (1945).

Report of meeting of Council of Society for Promotion of Engineering Education. A. F. GREAVES-WALKER. *Bull. Amer. Ceram. Soc.*, **24** [7] 273 (1945).

Report of Special Committee on Publications. J. L. CARRUTHERS, Chairman. *Bull. Amer. Ceram. Soc.*, **24** [7] 262 (1945).

Showrooms on wheels. Taking ware to the buyer. L. GOODMAN. *Pottery Gaz.*, **70** [814] 210–11 (1945).—The possibilities of displaying glass and pottery to advantage by the use of traveling showrooms (trailers) are discussed. Suggestions are given for effective displays. L.C.C.

Westinghouse sponsors better methods electric program. ANON. *Bull. Amer. Ceram. Soc.*, **24** [7] 252 (1945).

Construction, Care, and Use of Permissible Flame Safety Lamps. A. B. HOOKER. *U. S. Bur. Mines Miners' Circ.*, **44,** 18 pp., 5 figs. Price 10¢ from Supt. of Documents, Washington, D. C. R.A.H.

PATENTS

Binder for mold and core masses. SIEGFRIED ERBSLÖH. Fr. 881,505, April 28, 1943 (April 24, 1942); abstracted in *Chem. Zentr.*, **1944, I** [21/22] 1227.—The binder consists of bentonite-like clay to which are added, besides water, one or more water-soluble alkaline-metal compounds, e.g., hydroxides, carbonates, chlorides, sulfates, or phosphates. The quantity of the additions should be greater than that required for obtaining highest swelling capacity. M.HA.

Manufacture of solderable metallic layers on ceramic bodies for soldering metals of a melting point up to 400°C. STEATIT-MAGNESIA A.-G. (Hugo Berenz, inventor). Ger. 737,412, July 13, 1943 (May 11, 1939); cl. 80; abstracted in *Chem. Zentr.*, **1944, I** [3] 177.—The method consists in burning on a silver layer in any known manner and reinforcing this layer by electrolytically depositing or spraying on another easily solderable metal, especially copper, characterized in that the thus-metallized ceramic body is subjected to a heat-treatment in a reducing or inert atmosphere at between 400° and 800° so that a firmly adhering and dense joint between the Ag layer and the metallic reinforcement is obtained. M.HA.

THE ROSTER ISSUE

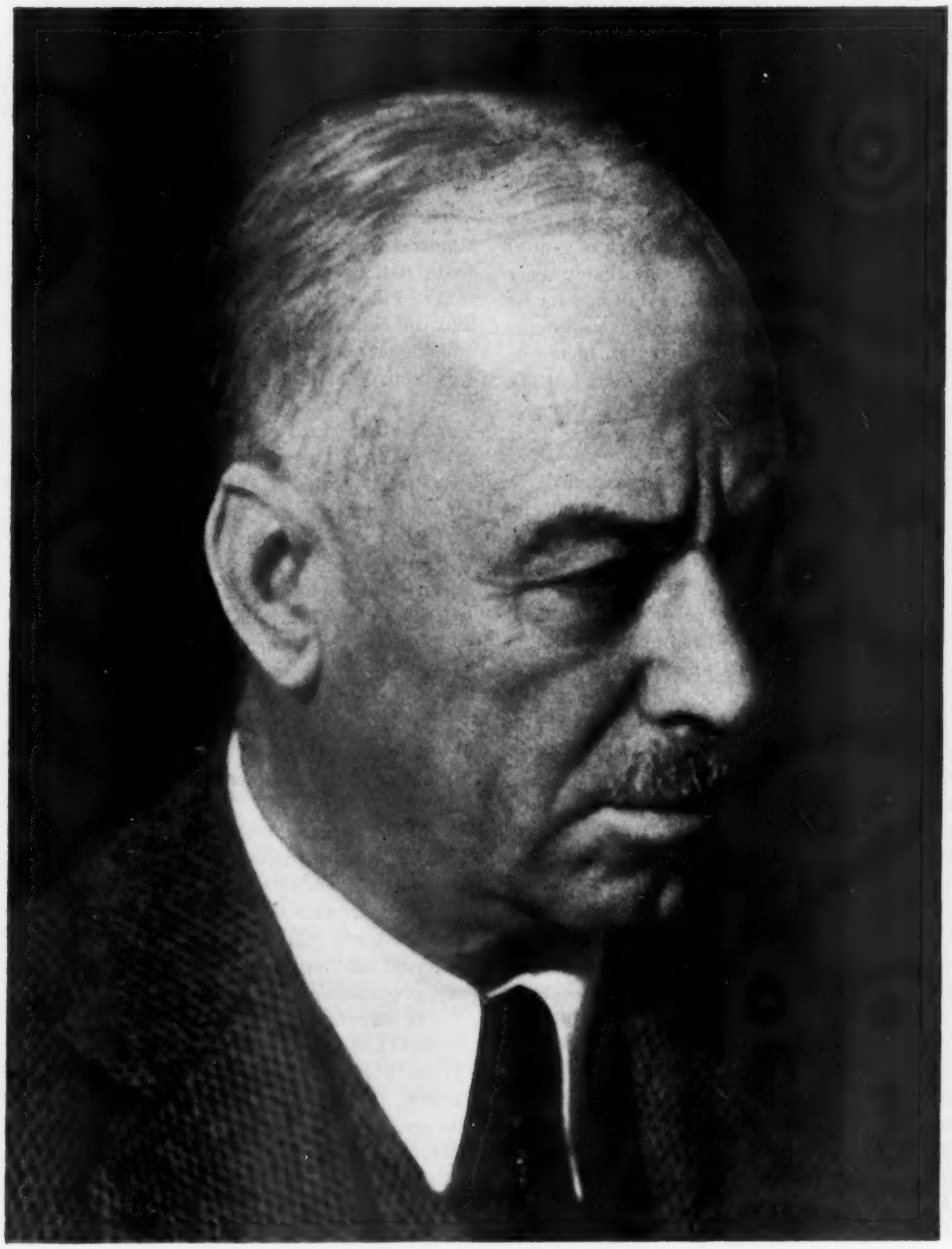
Did you return your listing card ?

Late in July we mailed a return card to every member of the Society asking him to check his address. You should have received one.

Did you return it ? If not, please do so at once. We need this information so that your listing in the Roster will be correct.

THE BULLETIN SECTION

Volume 24 August 15, 1945 **Number 8**



FRANCIS I. SIMMERS

HISTORY OF THE HALL CHINA COMPANY, EAST LIVERPOOL, OHIO

On the afternoon of July 7, 1903, the former partners in the inoperative East Liverpool Potteries Company met in the home of Robert Hall to settle the affairs and distribute the physical assets of the Company. Mr. Hall accepted, as his share, ownership of the plant located on the southeast corner of East Fourth and Walnut Streets, which had previously been known as the West, Hardwick and George Pottery. Thirty-eight days later, on August 14, 1903, he founded The Hall China Company, East Liverpool, Ohio. Three oven kilns were fired, and thirty-three potters began to make bed pans and combinets, the first chinaware to bear the trade name, Hall China.

The Company, born among the depressing ashes of failure, arose, not phoenixlike, but feeble and struggling for the very breath of life. It suffered from lack of capital and scrambled in stiff competition with more than a score of other small potteries. What plans Mr. Hall had for its future, what success he might have made of his unpromising acquisition, were never to be known. For, before he had an opportunity to get well under way, he died, in 1904, the year following the founding of the Company.

Development of Single-Fire Process

Robert Taggart Hall, son of the founder, assumed the management. Very early in his new job he began to investigate the possibilities of developing a glaze that would stand the heat required for bisque firing, thus making possible single-fire ware that would be proof against crazing. He had little to guide him. Ancient history books reputed that a single-fire china had been made during the Ming dynasty (A.D. 1368–1644) in China, but the lore was lost, and beyond the encouraging fact that what had been done could be done again, Mr. Hall had no precedent to follow. His practical experience, and that of his superintendent, Robert Meakin, made it clear, however, that a leadless glaze was necessary to the successful development of the single-fire process, for lead could not stand the temperature necessary for bisque firing.

From 1905 to 1911, Mr. Hall experimented tirelessly to develop the single-fire process and struggled to produce, at a profit, sufficient white ware, such as combinets, bed pans, mugs, and jugs, to keep the Company in operation. Dinnerware, added to the line in 1908, was made in small quantities until 1914, at which time its manufacture was discontinued until much later in the Company's history.

The fact that the Hall kilns kept burning during the initial years was due largely to the efforts of Francis I. Simmers, who became associated with Robert Taggart Hall soon after the death of the founder. During those lean days, Mr. Simmers kept the orders coming in and laid the groundwork for later developments.

So meager was the Company's income during this early period that payday for the plant employees was often just another day of worry and struggle for the management. Looking backward, it now seems that 1910 was the year of darkness before the dawn. On Memorial Day of that year, vandals entered the sliphouse, slashed the engine belts to ribbons, tore the pug mill apart, and riddled the silk lawns of the slip sifters, leaving behind them damage to the extent of $3000, an almost catastrophic loss. The vandals, or the motives that impelled them, were never discovered.

This incident seemed to spur Robert Hall's determination to produce chinaware by the single-fire process. Intensified research followed, and early in 1911, Mr. Hall and Jackson Moore, superintendent, who had succeeded Mr. Meakin in 1910, were to see the long search crowned with success.

First Successful Leadless Glaze

The first successful leadless glaze, in 1911, was mixed in a mortar with a pestle, and the quantity was just sufficient to dip half a mug. The mug was placed in the hottest part of the kiln, where the temperature was about 2200°F., and the result was "fair," which means that it was good enough to encourage further efforts. More of the glaze was prepared and a few bed pans were fired, and again the results were encouraging rather than successful. Next, it was decided to load an entire kiln with the glaze-dipped unfired bisque. The result pointed the way to complete success, for the pieces in the hottest part of the kiln were almost perfect, whereas those in the coolest part were unsatisfactory. It was obvious that a hotter fire was needed, so another load was fired at a maintained temperature of 2400°F., and when the kiln door opened, a new era was ushered in for The Hall China Company.

The ware that came from that kiln in 1911 was strong, hard, nonporous, and crazeproof. When Francis I. Simmers examined it, he turned to his partner and said, "Bob, if you continue to make ware like that, I'll sell so much of it you'll have to double the plant." Bob Hall did make the ware, and Ruby Simmers sold it in ever-increasing quantities.

In a few months, production had grown from two dozen to sixteen dozen pieces a day. And, although this is small in the light of today's output, it loomed large in comparison with the starvation years which had preceded it. If the Company was still a small youngster, it had now definitely survived and outgrown the vicissitudes of its enfeebled and precarious infancy.

The team of Robert Taggart Hall to make the ware and Francis I. Simmers to sell it worked in complete harmony. From 1911 to 1920, when Mr. Hall succumbed from a heart attack, the two men held the position of president alternately, a year at a time. Since the death of Mr. Hall, Mr. Simmers has served continuously as the Company's president.

1914 Brings Opportunities

The year 1914 brought opportunities of which the joint managers were quick to take advantage. Because of the war, European potteries, formerly the chief source of supply for stoneware items such as steam-table insets, coffeeurn liners, and other vessels used in the preparation and

serving of food, were unable to continue to make or ship their products to the United States.

All available production facilities at Hall were devoted to the manufacture of casseroles, teapots, coffeepots, coffee-urn liners, and similar items for the institutional trade. The war thus gave impetus to the trend toward Hall China cooking ware that had started in 1911 with the introduction of the single-fire product.

The more widespread use of Hall China during this period demonstrated to hundreds of institutional men the difference between the European ware and Hall single-fire china. The imported ware was soft, porous, absorbent; the finish rough. Hall China was smooth, nonabsorbent, and glistening when new; it was still smooth, nonabsorbent, and glistening after extended use.

When the war ended, and cheaper importations entered the country, users of Hall China had learned that it was less expensive in terms of cost per year and immensely cheaper in the subtler items of food preservation and customer satisfaction. Hall China was in the market to stay.

Growth Continues

In 1919, Hall's production facilities were increased through the purchase of the plant of the Goodwin Pottery Company at East Sixth and Broadway, and an entirely new line was introduced—gold-decorated teapots for the retail trade. Coincidentally with the introduction of Hall China gold-decorated teapots, the Company engaged in a campaign, which has been sustained throughout the years, to educate the American housewife in the proper method of brewing tea and the proper pot in which to brew it. Hall soon became the world's largest manufacturer of decorated teapots, a position it has consistently maintained.

The Company's sales of institutional cooking ware and decorated teapots continued to grow, and as they grew, new executive personnel was engaged. Malcolm W. Thompson, who joined the Company in 1920, is now treasurer and general manager. William J. Hocking started in 1921 and is today the Company's purchasing agent. Joseph R. Thompson, who became a member in 1925, is now secretary and sales manager. Robert H. Simmers joined in 1924 and has been vice-president since 1940. The Company's engineering and design staff was also enlarged and has been regularly augmented during the course of the years, and the policy of continuing research pursued by this staff, headed by L. H. Brown, has been largely responsible for the successful development of a wide variety of underglaze colors, the series of design innovations that were issued by Hall before the present war, and the many advancements in manufacturing methods that have contributed to maintenance of high quality in finished ware.

In 1927, a third plant was opened and its facilities were used exclusively to produce a new line—soda-fountain jars. Another new line was introduced during the following year—decorated cooking china, distributed through retail-trade channels.

New Factory

Success brings its problems as well as its triumphs. Consequently, in 1929, the Hall management, realizing that the Company's growth was destined to exceed the capacity of its three potteries and that obsolescence of equipment made imperative the need for new and more efficient methods and facilities, decided to erect an entirely new factory and to abandon the three old plants upon its completion.

A tract of twenty-three acres in the East End became the site for the building which was first occupied in 1930. The new factory was 250 feet wide by 680 feet long, and there were approximately 170,000 square feet of floor space, all on one floor. The entire floor space was open, and the production layout enabled continuous, progressive movement of work. Firing equipment in the new factory consisted of three tunnel kilns—one open-fire multiburner, one muffle-fire, and one semimuffle-fire glost kiln. All were fired with natural gas. The open-fire unit was turned in when the building was first occupied. The glost kiln was turned in the following year, and the muffle-fire unit was placed in operation in 1933.

In 1933, The Hall China Company engaged in the manufacture of decorated cooking china, teapots, and coffeemakers. The year 1936 brought further expansion in the line, when, for the first time since 1914, dinnerware took shape on the jiggerman's wheel, flowed through glazing, firing, decorating, and inspection processes to the shipping room, and thence to market.

The Company's activities in these fields have necessitated eight additions to the building and the installation of four other firing units. The additions, the first of which was made in 1934 and the last of which was completed in 1941, have provided a total of 385,000 square feet of floor space. The additional firing equipment consists of a circular electric kiln and a gas-fired multiburner turned in 1935, a circular gas-fired glost kiln turned in 1936, and a return-tray electric decorating kiln installed in 1937.

The war has brought new problems to The Hall China Company, as it has all other American manufacturers. Yet it seems that adversity has always been a stepping-stone to greater success at Hall, and those who keep their fingers on the pulse of the ceramic industry will continue to observe with keen interest how Hall solves its war and postwar problems.

UNITED STATES PATENT OFFICE INAUGURATES NEW SERVICE

A new service to industry and inventors was put into operation by the United States Patent Office June 1, 1945. The purpose of the service is to bring to the attention of the Nation patented inventions under which the owners are willing to grant licenses on reasonable terms. It is hoped that such information will lead to greater employment opportunities in the reconversion period, as well as permit industry to become acquainted with what is being done in various fields.

To accomplish these purposes, a Register of Patents Available for Licensing is being established and will be maintained in the United States Patent Office. Patents recorded on this Register will be available to the public for inspection in Washington, D. C. Lists of such patents will be published in the *Official Gazette of the United States Patent Office*.

RECORD OF POTTERY INDUSTRY IN EAST LIVERPOOL DISTRICT

REVISED BY WILLIAM H. VODREY, JR., *East Liverpool, Ohio**

EAST LIVERPOOL, OHIO

Year established	Dates of changes	Names of original companies and their successors	Location	Kind of ware
1830?	1852?	Longs Run or Sprucevale Pottery	Northwest corner Section 15, St. Clair Township	Rockingham and yellow
1840		James Bennett	Southeast corner 2d and Jefferson Sts.	"
	1841	Bennett & Bros.	"	"
	1844	Thomas Croxall & Bros.	"	"
	1852	Plant destroyed by flood		
1840		Benjamin Harker, Sr.	River Road east of Homer Laughlin Pottery	"
		Benjamin & George S. Harker—Etruria Pottery	"	"
	1846	Harker, Taylor & Co.	"	"
	1851	Harker, Thompson & Co.	"	"
	1854	George S. Harker & Co.	"	"
	1879	"	"	White granite
	1890	Harker Pottery Co.	"	Semiporcelain
	1931	Moved to Chester, W. Va.		
1842		Salt, Mear, Ogden & Hancock	Northeast corner 2d and Washington Sts.	Rockingham and yellow
		Salt & Mear—Mansion House		
	1850	(William G. Smith & Benjamin Harker, Sr.)		
		Harker & Smith (also James Foster & D. & J. S.)	"	"
	1857	James Foster & William Garner	"	"
	1863	Croxall & Cartwright	"	"
	1888	G. W. Croxall & Sons	"	"
	1898	Croxall Pottery Co.	"	"
	1912	Suspended		
1844		John Goodwin	Southeast corner 2d and Market Sts.	"
	1845	"	"	Rockingham, yellow, and knobs
	1853	S. & W. Baggott—Eagle Pottery	"	Rockingham and yellow
	189–	Plant closed		
	1902	Mountford & Co.	"	Stilts, pins, and spurs
	1939	In operation		
1845		Ball & Morris—Union Pottery	Southeast 2d St. and Cherry Alley	Rockingham and yellow
	1855	McGilvary & Orr	"	"
	1857	Croxall & Cartwright	"	"
	1898	Croxall Pottery Co.	"	"
	1914	American Porcelain Co.	"	"
	1932	Suspended		
1847		William Brunt, Sr.	West side Market St. at 1st St.	Rockingham, yellow, and knobs
	1852	William Brunt & William Bloor	"	"
	1853	William Brunt, Sr.	"	"
	1881	Henry Brunt & Son—Riverside Knob Works	"	Clay and porcelain knobs
	1895	William H. Brunt	"	"
	1911	Riverside Knob Co.	"	"
	1917	General Porcelain Co.	"	"
	1930	Riverside Knob Co. (John C. Miller)	"	"
	1891	Henry Brunt & Son—Riverside Knob Works	"	Electrical porcelain
	1895	George F. Brunt & C. F. Thompson	"	"
	1907	G. F. Brunt Porcelain Co.	"	"
	1911	General Porcelain Co.	"	"
	1930	Riverside Knob Co. (John C. Miller)	"	Knobs
1847		Woodward & Vodrey—Herculaneum Pottery	South side East 4th St. from Walnut St. to Elm St.	Rockingham and yellow
	1848	Woodward, Vodrey & Booth	"	"
	1849	Woodward, Blakely & Co.	"	Rockingham, yellow, and terra cotta
	1857	Discontinued business		

* For original listing, see *Ohio Geol. Survey Bull.* [4th Series], No. 26, pp. 74–81 (1923).

Year established	Dates of changes	Names of original companies and their successors	Location	Kind of ware
1853		Knowles & Harvey—Plant No. 1, Old End, East Liverpool Pottery Works	Northwest corner 6th and Walnut Sts.	Rockingham and yellow
	1867	Isaac W. Knowles	"	"
	1870	Knowles, Taylor & Knowles—Plant No. 1, Old End	"	"
	1872	Knowles, Taylor & Knowles	"	White granite
	1890	"	"	Semiporcelain
	1929	American Chinaware Corp., Plant E	"	"
	1931	Suspended		
1880		Knowles, Taylor & Knowles—Plant No. 2, New End	West side Walnut St. North Potters Alley	White granite
	1890	"	"	Semiporcelain
	1929	American Chinaware Corp., Plant E	"	"
	1931	Suspended		
1879		Surles & Gamble	Northeast corner Buckeye Alley and Bradshaw Ave.	Rockingham and yellow
	1882	Flentke, Harrison & Co.	"	"
	1885	Knowles, Taylor & Knowles—Plant No. 3, Buckeye	"	White granite
	1890	"	"	Semiporcelain
	1929	American Chinaware Corp., Plant E	"	"
	1931	Suspended		
1888		Knowles, Taylor & Knowles—Plant No. 4, China Works	North side Bradshaw Ave. east of Plant No. 3	Porcelain and lotus
	1898	"	"	Semiporcelain
	1929	American Chinaware Corp., Plant E	"	"
	1931	Closed		
1857		Vodrey & Bros.—Palissy Works	Southeast corner 4th and College Sts.	Rockingham and yellow
	1879	Vodrey & Bros.	"	"
	1896	Vodrey Pottery Co.	"	Semiporcelain
	1928	Suspended		
1847		John Henderson—Salamander Pottery Works	South corner Broadway and St. Clair Ave.	Rockingham and yellow
	1857	Morley, Godwin & Flentke	"	"
	1870	"	East side Broadway, 5th to 6th Sts.	"
	1874	"	"	White granite
	1878	Godwin & Flentke	"	"
	1882	William Flentke	"	"
	1886	Standard Co-Operative Co.	"	"
	1890	" No. 1	"	Semiporcelain
	1926	Suspended (moved to New Cumberland, W. Va., as Cronin China Co.)		
187–		Flentke, Worcester & Co.—Buckeye Pottery Works	South corner St. Clair and Broadway	Rockingham and yellow
	1877	Flentke, Harrison & Co.	"	"
1859		William Bloor—East Liverpool Porcelain Works	Northeast corner Walnut and Third Sts.	Porcelain and novelties
		U. S. Pottery Works		
	1862	William Brunt, Jr., & Co.—Phoenix Pottery Works	"	Rockingham and yellow
	1878?	William Brunt, Son & Co.	"	White granite
	1894	William Brunt Pottery Co.	"	Semiporcelain
	1926	Hall China Co.	"	"
	1930	Moved to Klondyke Plant		
1859		William Brunt, Jr., & Co.—Phoenix Pottery	Southeast corner Walnut and 4th Sts.	Rockingham and yellow
	1865	Thompson, Jobling, Taylor & Hardwick—Lincoln Pottery Works	"	"
	1867	West, Hardwick & Co.	"	"
	1879	"	"	Cream-colored
	1882	"	"	White granite
	1884	George Morley & Son—Lincoln Pottery	"	White granite and majolica
	1890	Discontinued business		
	1894	East Liverpool Pottery Co.	"	White granite
	1896	"	"	Semiporcelain
	1903	East Liverpool Potteries Co.	"	"
	1905	Hall China Co.	"	"

Year established	Dates of changes	Names of original companies and their successors	Location	Kind of ware
	1913	Hall China Co.	Southeast corner Walnut and 4th Sts.	Porcelain
	1930	Moved to Klondyke Plant		
1930		Hall China Co.	Northeast corner Elizabeth and Harvey Ave.	"
1859		Elijah Webster—A. Webster & Co.	East side Jackson St. at 1st St.	Stoneware
	1864	Manley & Cartwright—Industrial Pottery	"	Rockingham and yellow
	1872	Manley, Cartwright & Co.	"	"
	1880	Cartwright Bros. Co.	"	"
	1887	"	"	Yellow and cream-colored
	1890	"	"	White granite
	1891	"	"	Semiporcelain
	1924	Suspended		
1863		John Goodwin Novelty Pottery Co.	Southeast corner Broadway and 6th St.	Yellow ware and novelties
	1865	Marks, Farmer, Manley & Riley—A. J. Marks & Co.	"	Rockingham and yellow
	1869	McNicol, Burton & Co.	"	Rockingham, yellow, and white granite
	1892	D. E. McNicol Pottery Co.	"	Yellow, cream-colored, and white granite
	1930	Moved to Clarksburg, W. Va.		
1903		East Liverpool Electrical Porcelain Co.	West side Boyce St. between Mapletree and Elmtree	Electrical porcelain
	1912	General Porcelain Co.	"	"
	1916	Bisque Novelty Works (George S. Thompson)	"	Novelties, doll heads, etc.
	1919	D. E. McNicol Pottery Co.	"	"
	1931	Trymore Clay Products Co.	"	"
	1933	Bellmar Pottery Co.	"	"
	1935–1937	Goodwin Pottery Co.	"	"
1895		Edward O'Connor	East side Starkey St.	Rockingham and yellow
	1902	D. E. McNicol Pottery Co.	"	"
	1921	In operation		
	1927	Hall China Co.	"	Porcelain
	1930	Moved to Klondyke		
1904		Anderson Porcelain Co.	South side Harvey Ave. between Myrtle and Putnam	Electrical porcelain
	1911	General Porcelain Co.	"	"
	1916	Louthan Manufacturing Co.	"	Electrical porcelain and gas porcelain
1866		Starkey & Simms—Star Stoneware	Southeast corner Dresden and 8th St.	Stoneware
	1868	Laughlin & Simms	"	"
		Ferguson & Simms	"	"
		N. M. Simms & Co.	"	"
	1875	Brunt, Bloor, Martin & Co.—Dresden Pottery	"	White granite
	1882	Potters' Co-Operative Co.	"	"
	1890	"	"	Semiporcelain
	1925	Dresden Pottery Co.	"	"
	1927	Discontinued business		
1867		Hill, Brunt & Co.	Southwest corner 5th and Walnut Sts.	Rockingham and yellow
	1874	John Wyllie & Son—Great Western Pottery Works	"	White granite
	1891	Union Pottery Co.	"	"
	1896	"	"	Semiporcelain
	1904	Discontinued business		
1868		McDevitt, Cochran & Co.—California Pottery	California Hollow	Rockingham and yellow
	1871	McDevitt & Moore	"	Majolica and jet ware
	1900?	Discontinued business		
1868		Thompson & Herbert	River Road, east of Sugar Alley	Rockingham and yellow
	1870	C. C. Thompson & Co.	"	"
	1884	"	"	Yellow and cream-colored
	1890	"	"	Cream-colored and white granite
	1918	"	"	Semiporcelain
	1938	Suspended		

Year established	Dates of changes	Names of original companies and their successors	Location	Kind of ware
1867		Burgess, Webster & Viney—Webster, Viney & Co.	South side West 8th St.	Stoneware
	1871	Starkey & Ourly—Star Pottery	"	Rockingham and yellow
	1872	Samuel Worcester & Son	"	"
	187–	Bulger & Worcester	"	"
	1886	Discontinued business		
1863		Agner & Foutts—American Pottery Works	Northeast corner 2d and Market Sts.	"
	188–	Agner & Gaston	"	"
	1887	Sebring Pottery Co.	"	White granite
	1900	Sevres China Co.	"	Semiporcelain
	1908	Warner-Keffer China Co.	"	"
	1910	Suspended operation		
1857		Joseph Foster & George Garner	Northeast corner Broadway and 6th St.	Rockingham and yellow
	1860	Joseph Foster & James Rowley	"	"
	1865	Foster & Rigby	"	"
	186–	T. Rigby & Co.—Broadway Pottery	"	"
	1872	John Goodwin	"	White granite
	1876	Goodwin Brothers	"	"
	1893	Goodwin Pottery Co.	"	Semiporcelain
	1913	Davidson & Stevenson, lessees	"	Electrical porcelain
	1919	Hall China Co.	"	Semiporcelain
	1930	Moved to Klondyke Plant		
1872		R. Thomas & Sons Co.	North side West 7th St.	Clay knobs
	1884	" —American Knob Works	"	Clay knobs and porcelain wiring knobs
	1885	R. Thomas & Sons Co.	"	Low-voltage porcelain
	1897	"	"	High-voltage porcelain
	1927	Moved to Lisbon Plant		
1873		Laughlin Bros. Pottery—Ohio Valley Pottery	River Road, east of Thompson Pottery	White granite
	1879	Homer Laughlin Pottery	"	Porcelain
	1897	"	"	Semiporcelain
	1903	National China Co.	"	"
	1911	Harker Pottery Co., Plant 2	"	"
	1931	Moved to Chester, W. Va.		
1858?		Booth Brothers		Novelties and heating stoves
	1865	Discontinued business		
1868		Jackson Brothers	Northeast corner 7th and Jefferson Sts.	China and parian
	1870	Discontinued business		
1865?		William Colclough	Northwest corner 6th and Sugar Sts.	Porcelain, clay pipes, and novelties
	1895	Discontinued business		
1867?		Jacob Morton		Clay pipes
	1870?	Discontinued business		
1848?		Wyllie Brothers		Rockingham and yellow
	1854?	Discontinued business		
1877		Benjamin Harker & Sons—Wedgwood Pottery	River Road, east of Harker Pottery	Cream-colored
	1881	Wallace & Chetwynd—Colonial Pottery	"	White granite
	1896	"	"	Semiporcelain
	1903	East Liverpool Potteries Co.	"	"
	1905	Colonial Co.	"	"
	1929	Suspended operations		
1879		Burford Brothers	Northwest corner Green Lane and East 7th St.	Floor and wall tile
	1881	"	"	Cream-colored and white granite
	1896	"	"	Semiporcelain
	1905	Standard Pottery Co. No. 2	"	"
	1920	Potters' Co-Operative Co.	"	"
	1925	Dresden Pottery Co. No. 2	"	"
	1927	Discontinued business		

Year established	Dates of changes	Names of original companies and their successors	Location	Kind of ware
1881		Frederick, Shenkel, Allen & Co.—Globe Pottery	River Road, east of Colonial Pottery	Rockingham and yellow
	1888	Globe Pottery Co.	"	Semiporcelain
	1903	East Liverpool Potteries Co.	"	"
	1905	Globe Pottery Co.	"	"
	1913	T. A. McNicol Pottery Co.	"	"
	1926	Suspended		
1874		Golding Sons Co.	Southside West 4th St.	Flint and feldspar
	1937	Suspended		
1887		Potters Mining & Milling Co.	North side Railroad St. east of Boyce St. and east of Trenle Pottery	"
	1939	In operation		
1903		Ohio Silica Co.		Flint
	1924	Suspended		
1920		General Pulverizing Co.	Southeast corner Minerva and Walnut Sts.	Feldspar
	1920	Plant burned		
1890		Burgess & Co.—American China Co.	South side West 8th St.	Bone china
	1893	West End Pottery Co.	"	Semiporcelain
	1938	Suspended		
1894		East End Pottery Co.	North side Railroad St. east of Boyce St.	White granite
	1903	East Liverpool Potteries Co.	"	Semiporcelain
	1905	East End Pottery Co.	"	"
	1910	East End China Co.	"	"
	1915	Trenle China Co.	"	"
	1917	Trenle Porcelain Co.	"	Electrical porcelain and porcelain
	1937	Moved to Ravenswood, W. Va.		
1895		French China Co.	West side Pearl St. at Michigan and Elizabeth Sts.	Semiporcelain
	1901	Smith-Phillips China Co.	"	"
	1929	American Chinaware Corp., Plant F	"	"
	1931	Johnson China Co.	"	Semiporcelain and porcelain
	1937	Specialty Porcelain Works (Boch)	"	Electrical porcelain
1899		National China Co.	North side Railroad St. between Virginia and Boyce	Semiporcelain
	1903	Homer Laughlin China Co., Plants 1, 2, and 3	"	"
	1929	Moved to Newell, W. Va.		
1890		Corns Knob Works	Laura Ave.	Door and furniture knobs
	1900?	Benty Brothers	"	Artware
	1906	Craven	"	
	1910?	Suspended operations		
1907		Adamant Porcelain Co.	North side West 6th St.	Electrical porcelain
	1912	"	"	Sanitary ware
	1915	T. V. Milligan Porcelain Co.	"	Electrical ware
	1929	Peach Porcelain Co.	"	"
	1932	Ceramic Specialties Co.	"	"
1883?		Burgess & Co.—American Stilt Works	Southwest corner 4th and Cherry Alley	Stilts, pins, and spurs
	1894	Plant dismantled		
1893		Burton & Garner	South side Ravine St. between Blakely and Bradshaw	Pins, stilts, spurs, and knobs
	1898	Corns & Williams	"	Specialties
	1903	Suspended		
1880?		Robertson & Co.—Diamond Stilt Works	Northwest corner Union and 1st Sts.	Stilts, pins, and spurs
	1882	Rowe & Mountford	"	"
	1891	"	"	Potters' supplies and white granite
	1894	George C. Murphy & Co.	"	White granite
	1896	"	"	Semiporcelain
	1903	East Liverpool Potteries Co.	"	"
	1904	Discontinued business		
1890		Potters Supply Co.	West side Washington St. at 1st St.	Stilts, pins, spurs, etc.
	1940	In operation		

Year established	Dates of changes	Names of original companies and their successors	Location	Kind of ware
1902		Louthan Supply Co.	Southwest corner Jefferson and West 8th Sts.	Heating porcelain for electricity and gas
	1916	Louthan Manufacturing Co.	"	"
	1922	Moved to Klondyke		
1868		Fowler & O'Connor—Phoenix Terra Cotta Works	North side Bradshaw Ave. opposite Ravine St.	Terra cotta
	1873	Suspended		
1874		Thomas Haden	West 7th St. near Market St.	Decorating shop
	1879?	Suspended operation		
1874		Joseph Dennis	Northeast corner Washington and Pink Alley	"
	1886	Suspended business		
1877		George F. Humrickhouse	Southwest corner Broadway and Potters Alley	"
		James H. Baum	"	"
	1884	Thomas Haden	"	"
	1888	Suspended business		
1879		John F. Steel	Grove Alley between 4th and 5th Sts.	"
	1891	Discontinued business		
1885		George Buxton	Rural Lane near Jackson St.	"
	1891	Discontinued business		
		WELLSVILLE, OHIO		
1826		Joseph Wells		Stoneware
	1856	Discontinued business		
1878		Morley & Co.—Pioneer Pottery	Southwest corner Commerce and 9th Sts.	White granite and majolica
	1890 1896	Pioneer Pottery Co.	"	White granite and semiporcelain
	1900	Wellsville China Co.	"	"
	1933	"	"	Porcelain
1882		John Patterson & Sons Pottery Co.	North side 12th St. at Anderson Ave.	Rockingham and yellow
	1900	Patterson Brothers Co.	"	"
	1917	Sterling China Co.	"	Vitrified hotel china
	1939	In operation		
1886		Webster, Campbell & Co.—School House Pottery	Northwest corner 6th and Washington Sts.	White granite
	1888	James H. Baum	"	Cream-colored, sanitary ware, and white granite
	1904	McNicol-Smith Co.	"	"
	1906	"	"	Semiporcelain
	1907	McNicol-Corns Co.	"	"
	1928	Corns China Co.	"	"
	1932	Plant burned		
1894		Burgess & Co.	Southwest corner Lisbon and 3d Sts.	Stilts, pins, and spurs
	1935	Suspended		
1845		George & John Garner, Enoch Bullock	"	Rockingham and yellow
	1847	Suspended		
1867		Leonard Jones	Southwest corner Lisbon and 3d Sts.	Terra cotta
	1870	George Jones	"	"
	1880	Suspended		
1852		John Lyth & Sons Co.	South side Wellsville at Corporation Line	"
		Ohio Terra Cotta Works	"	"
	1905	Suspended		
1898		United States Pottery Co.	Southwest corner Main and 20th Sts.	Semiporcelain
	1903	East Liverpool Potteries Co.	"	"
	1936	Purinton Pottery Co.	"	"

SALINEVILLE, OHIO

Year established	Dates of changes	Names of original companies and their successors	Location	Kind of ware
1902	1904	Dresden China Co.	North side Main St. at first bridge	Semiporcelain
	1910	National China Co.	"	"
	1929	American Chinaware Corp., Plant G	"	"
	1931	John Winterich	"	"
	1937	Plant burned		

LISBON, OHIO

1900		Thomas China Co.	South side Washington St. at crossing, Lisbon	"
	1905	R. Thomas & Sons Co.	"	Electrical porcelain
	1939	In operation		

CHESTER, WEST VIRGINIA

1900		Taylor, Smith & Taylor Co.	River front	Semiporcelain
	1939	In operation		
1900		Edwin M. Knowles China Co.	East end Phoenix Ave.	"
	1931	Harker Pottery Co.	"	"
1913		Davidson-Stevenson Porcelain Co.	North side Newell Rd. at Corporation Line	Electrical porcelain and novelties
1921		Davidson Porcelain Co.	"	"
	1936	Suspended		

NEWELL, WEST VIRGINIA

1848		Larkins Brothers—Virginia Pottery	East end Grant St.	Rockingham and yellow
	1857	William Thompson		
	1861	Suspended		
1907		John Boch	Northeast end 6th St.	Electrical porcelain
	1937	Moved to Klondyke		
1910		Novelty Clay Forming Co.	Northwest corner 3d and Harrison St.	Clay novelties
	1919	Boch-Metsch Porcelain Co.	"	Electrical and heating porcelain
	1922	Metsch Refractories Co.	"	"
1913		Edwin M. Knowles China Co.	North side Harrison St. at 5th St.	Porcelain
	1939	In operation		
1907		Homer Laughlin China Co., Plants 4 to 8, inclusive	North side Harrison St. between 5th and 10th Sts.	"
	1939	In operation		

OTHER POTTERIES IN EAST LIVERPOOL DISTRICT

1842		George McCullough	Liverpool Township	Terra cotta and brick
	1846	Philip F. Geisse	"	"
	1852	N. U. Walker & Co.—Cliff Mine Terra Cotta Works	"	"
	1900	Suspended		
1876		Herman Feustel	Northwest corner State and Chestnut Sts., Leetonia, Ohio	
		Bradshaw Pottery Co.	Rogers, Ohio	
		Ohio China Co.	East Palestine, Ohio	

OUR STAKE IN THE PEACE

"Ignorance, rather than perversity and greed, is still man's costliest enemy, and research, in the long run, is still man's most profitable investment."

—From an address by William E. Wickenden, President, Case School of Applied Science

LAMME MEDAL PRESENTED TO TAINE GILBERT McDOUGAL

At the Sixty-Eighth Annual Commencement at Ohio State University, Columbus, Ohio, June 8, 1945, President Howard L. Bevis presented the Lamme Medal to Taine Gilbert McDougal. This Medal was established in 1924 by a bequest of Benjamin Lamme, a graduate of Ohio State University in the class of 1888. It is awarded annually to the alumnus of Ohio State University who is chosen for meritorious achievement in engineering or the technical arts. The donor was chief engineer of the Westinghouse Electric and Manufacturing Company for many years and chose this method of rewarding accomplishment in the engineering field.

Taine G. McDougal was born at New Lexington, Ohio, September 20, 1889, and received his degree in ceramic engineering from Ohio State University in 1911. Following graduation, he was employed by the Clay Products Co., Spokane, Wash., and the Universal Sanitary Manufacturing Co., New Castle, Pa. In 1915, he was employed by the A C Spark Plug Co., Flint, Mich., a subsidiary of the General Motors Corporation, as ceramic engineer to develop a spark-plug insulator using domestic materials and needed to replace the use of a prepared body, the importation of which was interrupted with the invasion of France in World War I. Since 1928, he has been vice-president of the A C Spark Plug Company, a division of General Motors.

The Faculty Committee which nominated Mr. McDougal for the award said that he had been responsible for many of the outstanding advancements in the spark-plug industry in the last thirty years, including the development of the monolithic spark-plug porcelains which have made the high-altitude bomber possible. He is also responsible for the development of the processes for manufacturing these spark plugs.

He is a Fellow of The American Ceramic Society and has been a member since 1913.

Taine Gilbert McDougal

Patents Granted to Mr. McDougal

(1) (With Albert Champion) "Insulating Material and Body Composed Thereof," U. S. 1,262,305, April 9, 1918.

(2) "Spark Plug," U. S. 1,386,883, August 9, 1921.

(3) "Burning Ceramic Ware and Apparatus Therefor," U. S. 1,416,726, May 23, 1922.

(4) "Burning Ceramic Ware," U. S. 1,416,727, May 23, 1922.

(5) (With S. J. McDowell) "Synthetic Jewel Bearing," U. S. 1,422,216, July 11, 1922.

(6) "Spark-Plug Insulator," U. S. 1,434,133, October 31, 1922.

(7) (With S. J. McDowell) "Synthetic Jewel Bearing," U. S. 1,438,188, December 12, 1922.

(8) "Continuous Tunnel Kiln," U. S. 1,710,995, April 30, 1929.

(9) "Method of Heat-Treatment and Apparatus Therefor," U. S. 1,713,851, May 21, 1929.

(10) "Tunnel-Kiln Construction," U. S. 1,713,852, May 21, 1929.

(11) (With D. W. Randolph) "Spark Plug," U. S. 1,746,051, February 4, 1930.

(12) "Gravity-Feed Tunnel Kiln," U. S. 1,788,885, January 13, 1931.

(13) "Ceramic Ware and Method of Manufacture," U. S. 1,862,974, June 14, 1932.

(14) "Spark Plug," U. S. 1,872,778, August 23, 1932.

(15) "Ceramic Material and Method of Making," U. S. 1,909,785, May 16, 1933.

(16) "Spark-Plug Electrode," U. S. 1,940,314, December 19, 1933.

(17) "Ceramic Process," U. S. 1,955,821, April 24, 1934.

(18) "Igniting Device for Internal Combustion Engines," U. S. 2,003,453, June 4, 1935.

(19) (With H. Rabezzana, J. T. Ford, and W. S. Kirk) "Two-Piece Center Wire Spark Plug," U.S. 2,071,571, February 23, 1937.

(20) "Method of Making Ceramic Products," U. S. 2,092,001, September 7, 1937.

(21) (With A. H. Fessler and Karl Schwartzwalder) "Spark-Plug Insulator," U. S. 2,120,338, June 14, 1938.

(22) "Tunnel Kiln," U. S. 2,137,091, November 15, 1938.

(23) (With A. H. Fessler and H. B. Barlett) "Spark-Plug Insulator," U. S. 2,152,655, April 4, 1939.

(24) (With A. H. Fessler and Karl Schwartzwalder) "Insulator for Spark Plugs," U. S. 2,152,656, April 4, 1939.

(25) (With A. H. Fessler and H. B. Barlett) "Ceramic Body for Spark-Plug Insulators," U. S. 2,177,943, October 31, 1939.

(26) (With A. H. Fessler and H. B. Barlett) "Ceramic Body for Spark-Plug Insulators," U. S. 2,214,931, September 17, 1940.

(27) (With A. H. Fessler and Karl Schwartzwalder) "Ceramic Body," U. S. 2,218,584, October 22, 1940.

(28) (With A. H. Fessler and H. B. Barlett) "Ceramic Body for Spark-Plug Insulators," U. S. 2,232,860, February 25, 1941.

(29) "Spark Plug," U. S. 2,267,571, December 23, 1941.

(30) (With A. H. Fessler and Karl Schwartzwalder) "Ceramic Articles and Method of Making," U. S. 2,272,346, February 10, 1942.

(31) "Spark Plug," U. S. 2,280,962, April 28, 1942.

(32) (With R. W. Smith and Karl Schwartzwalder) "Spark-Plug Electrode," U. S. 2,296,045, Sept. 15, 1942.

(33) (With Karl Schwartzwalder) "Ceramic Composition and Articles Made Therefrom," U. S. 2,308,092, January 12, 1943.

(34) "Spark Plug and Method of Making," U. S. 2,321,840, June 15, 1943.

(35) (With Karl Schwartzwalder) "Ceramic Article and Method of Making," U. S. 2,336,182, Dec. 7, 1943.

(36) (With Max Muller and Karl Schwartzwalder) "Drying Apparatus and Method," U. S. 2,360,257, October 10, 1944.

WAR VETERANS IN THE POSTWAR CERAMIC INDUSTRY*

By J. E. Eagle

Abstract

Most ceramic engineers now in the armed services will expect to return to positions in the industry. They will want to be brought up to date on ceramic technology and developments. How will they secure this information? By refresher courses, files of technical cases, trade magazine digests? Will they secure positions by advertising themselves to the industry or through some coordinated plan sponsored by The Society?

Is there a place in the industry for veterans who will be physically handicapped? Other industries have developed detailed courses of training and job instruction to utilize wherever possible a supply of labor which is considered particularly dependable and to provide a means of livelihood on a strictly economic basis for men to whom all American industry is indebted. It is recommended that a committee of The American Ceramic Society be appointed to study the feasibility of employing disabled veterans in selected occupations and to consider the establishment of on-the-job training programs.

I. Introduction

The title of this paper might suggest that the writer has been able to analyze thoughtfully the future problems of the ceramic industry with respect to war veterans and has been able to accumulate sufficient pertinent data to warrant presentation of a definite program or plan of attack leading to the solution of these problems. Actually, the situation is quite the contrary in that the various aspects of the problems to be discussed certainly are not clearly seen, and workable ideas with respect to methods of attack have been notable by their absence.

This paper, then, presumes only to present the writer's ideas regarding some possible difficulties which may face war veterans in the ceramic industry and to rather hesitantly set forth certain thoughts pertaining to them to provoke thought and discussion by the members of this Society regarding the questions raised. Should such consideration indicate a probable need for action, it is hoped that constructive suggestions will be forthcoming to assist in the formulation of a program by The Society.

II. Obligation of The American Ceramic Society

In common with all technical societies and other organizations throughout the Nation, The American Ceramic Society is indebted to the armed forces for its continued free existence. Returning ceramists deserve from The Society, and from the ceramic industry at large, more than the mere opportunity to hunt for a job, to resume the payment of dues, and to struggle to fit themselves once more into the industrial picture. Even from a strictly selfish viewpoint, however, the need for engineers in the industry promises to be so great as to call for positive action in making the quickest and best use of those released from service. Ceramic educators now calculate a gap of ten years between the time of graduation of the last normal class of ceramic engineers and that of the next expected normal class, so that efficient utilization of our present supply is required.

The ceramic engineers now in service will return to an industry which has not experienced any considerable plant conversion for war production. With some exceptions, ceramic plants have manufactured during wartime, and often for direct war purposes, their normal peacetime products. With no necessity for reconversion, they stand ready to expand production as quickly as additional material and labor become available.

The returning engineer will not find, however, that lack of conversion has meant a lack of technical progress or of change in manufacturing operations. The pressure of wartime demand to reach required production goals has stimulated research, invention, and adaptation throughout the industry. Articles which were laboratory trials when these men left will be production-line items when they return. New glasses, enamels, and porcelains have made their appearance; constantly improved equipment has been provided, and raw materials in greater volume and variety have been made available to the industry. Ceramic products have successfully invaded new wartime markets, and additional peacetime pioneering may be expected.

At war's end, however, many ceramic engineers will have been out of touch with industry from some years and consequently uninformed regarding details of recent developments. Unlike many chemical, electrical, and mechanical engineers, their service experience has not included work or contacts in their own field of training, so that their divorcement from ceramic thought and practice has been complete. Some have already expressed serious doubt of their ability to step into a plant or laboratory job and give a good account of themselves—to "catch up with the parade."

In the writer's opinion, this should be a matter of concern and a challenge to The American Ceramic Society and to the Institute of Ceramic Engineers. We have an obligation to devise a program aimed at the elimination of this doubt and designed to fit the varying needs of the different age groups.

The younger engineers who were graduated either immediately or only shortly before entering the service have expressed a wish for refresher courses in ceramic subjects. Because of the lapse in time and the fact that they had no opportunity to put their ceramic training into actual use

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and thus relate theory to practice, they feel the need of a review to restore their previous grasp of the subject. This matter may primarily concern the ceramic colleges and already has had their serious attention, but The Society should share in the development and correlation of a series of courses covering the several ceramic fields and keep its service members informed as progress is made so that they may formulate plans in advance of their actual discharge.

The older engineers with some years of plant experience might be expected to be more interested in securing information on developments throughout the industry, especially in their own particular field. Access to the complete story may not be readily available to many unless some action is taken to provide it through the back files of The Society publications and the various trade magazines. It is improbable that sufficient back numbers will exist to supply all who might want them permanently, but possibly enough could be assembled to form a lending pool or library from which they might be borrowed for restricted periods at about the cost of postage and handling. Some grouping into packets of several numbers each might be feasible to lessen the number of transactions.

The next subject to be considered is the actual placement in the industry of those engineers who will not return to formerly held positions and to whom the matter of getting to work without delay will be important. The time-honored routine of such job-getting is, of course, to write a properly humble yet duly self-laudatory letter to a dozen companies in the chosen field, to place anonymous advertisements in the trade papers, and to solicit recommendations from friends in the industry.

It should be possible for The Society to establish a more efficient and dignified procedure which will benefit not only the servicemen but also the companies who will be needing their services.

The Society might undertake to establish at the Columbus office a clearing house or placement office whose minimum function would be to receive, file, and dispense information relative to both jobs and job-seekers. In many instances, it should also be possible to supplement this service with advice and guidance, based on knowledge of the industry. Any such service should be available to all returning ceramists, whether Society members or not.

Should such a plan be feasible, the present time is none too soon to start securing information on the jobs to be filled, as discharges from service already are numerous. A survey of the various ceramic companies should disclose the number of openings expected, the type of work involved, and some indication of the required qualifications of prospective employees. Such data should facilitate the placement of engineers with a minimum of correspondence, travel, and delay.

As mentioned before, Society members in the armed forces should be advised by letter regarding any programs set up. The splendid news letters, already sent out by the Columbus office, seem to have evoked a most appreciative response which indicates a continued keen interest in industry and Society affairs. This interest would be further stimulated by the knowledge that we at home are thoughtfully planning for their return and trying to facilitate their reabsorption into the industry. They may also be able to contribute ideas of value in the formulation of any programs to be set up.

Such letters in the hands of ceramic servicemen might also conceivably have some propaganda value with other engineering graduates or undergraduates in the services who may be undecided regarding the field of work or training to which they will return. Information on ceramic courses, for which they will be eligible under the G. I. Bill of Rights at little or no expense (see p. 292), might influence them toward a ceramic career for which their previous college training has provided basic engineering knowledge which needs only to be supplemented by special ceramic courses.

III. Place of Disabled Veterans

Turning now from the discussion of discharged ceramic engineers and technologists, the writer presents for the thoughtful consideration of The Society the possibility of the employment, as skilled or semiskilled workers, of discharged veterans who have suffered varying degrees of disability. It is not necessary to include in this discussion the uninjured veterans in the skilled-labor category, as it is expected that, in most instances, former workers in ceramic plants, as in other industries, will gravitate to their prewar positions much as a matter of course. Their reemployment should not present grave difficulty in spite of the over-discussed need for readjustment to a normal life.

On the other hand, the employment by industry of the many thousands of partially disabled veterans does present serious problems, but it also presents opportunity—opportunity to repay in some measure the everlasting debt of the Nation to these men; opportunity to give them the self-respect that goes with honest, profitable employment and to make them independent of Government charity; and finally, the opportunity for industry to obtain, after necessary training, the capable and faithful services of men who are already proving themselves exceptionally dependable because of a greater incentive to make good and to hold a job.

Several industries have already developed detailed programs of vocational instruction and on-the-job training. These are not alone the result of patriotic impulse in wartime, but are sound, long-range programs designed to produce a body of highly skilled workers who can be counted on to stay with the industry. It is true that most of these are predominantly handcraft industries, such as the jeweler's industry, the printing industry, and the textile industry, but it is likewise true that there is a great deal of skilled handcraft work in the ceramic industry, even with the increased mechanization of recent years.

Should the ceramic industry, then, consider some similar program of training to fit these handicapped veterans as ceramic craftsmen? Is there sufficient handwork in the several branches of the industry to justify training, either on-the-job or by special vocational courses which might be established?

It should be pointed out that all of these men will have completed rehabilitation courses and, therefore, should not properly be termed "disabled," when such a term might imply that they are not capable of adequately performing the normal tasks connected with handwork jobs. Those men who have suffered severe leg injuries, of course, are

not expected to engage in work which requires standing for long periods.

Public Law 16 (see opposite column) provides for vocational rehabilitation to overcome the disability handicap and to restore to the veteran the employability lost by reason of injury. This may be accomplished by vocational courses at accredited institutions or by on-the-job training in industrial plants. In either case, the regular pension allowed for a specific degree of disability may be increased for the training period by an added sum to cover subsistence and also by a family allowance. These extra allowances are discontinued upon completion of training and subsequent employment at standard wages.

When men are accepted into industrial plants for on-the-job training, their productivity for some time may not warrant the usual compensation for such jobs. In these cases, special waivers are obtainable which permit their employment at substandard wage rates. As skill and productivity increase, and compensation is progressively allowed, the added subsistence and family allowances are concurrently decreased whenever the total pension plus wages is in excess of the standard wage scale for a given position. This prevents the veteran from enjoying a financial advantage over his fellow workers because of his special allowance, but at the same time permits him to profit from his work to the degree warranted by his productivity.

In most respects, a veteran engaged in on-the-job training holds the same status as other company employees. In open shops, he is free to join labor unions or not as he pleases. If employment is contingent on union membership, the Veterans Administration will pay his dues as a normal expense item of his training.

In the case of injury during the training period, however, the veteran retains his previous status under the Veterans Administration. Such injury, or aggravation to injury, is considered service-connected and, as such, entitles the veteran to the usual benefits under laws applicable to veterans of the present war. Such an injury, therefore, is not subject to handling under the regular industrial compensation laws and so cannot affect the insurance rate of a given company.

More complete details regarding the operations of the various programs of training authorized by law and information on the completed plans of the various industries are available at the offices of the Veterans Administration. For this Society, however, the immediate question to be resolved is what employment our industry has to offer for handicapped veterans. The urgency of this determination has been increased by the return of large numbers of casualties in recent weeks, so that no time is to be lost in at least beginning a survey of the situation.

As a starting point, the writer proposes that the President of The Society shall immediately appoint a committee to study this problem. The committee should include outstanding industry men from the several Society Divisions who are thoroughly familiar with plant practice and the requirements of individual jobs. It is recommended that the committee be prepared to present a report and suggestions for possible further action at the next meeting of the Board of Trustees.

Principal Provisions of Public Law No. 346, 78th Congress, June, 1944 ("G. I. Bill of Rights")

This law was drawn to provide postwar benefits for all veterans. Disabled veterans can elect under this law, although Public Law No. 16 was drawn specifically for them.

The G. I. Bill of Rights provides education and/or training for all honorably discharged veterans for a length of time in accordance with their length of service. Eligible veterans who serve 90 days or more in the active naval or military forces on or after September 16, 1940, are entitled to a minimum of one year of education, training, or vocational rehabilitation (or the equivalent thereof in continuous part-time study) or for such lesser time that may be required for the chosen course of instruction. Upon satisfactory completion of such chosen course, the veteran is eligible for additional periods of education or training but not to exceed the time such person was in the active service on or after September 16, 1940.

The Veterans Administration will pay to the educational or training institution the customary cost of tuition plus additional fees customarily charged and may pay for books, supplies, etc., exclusive of board and lodging in an amount not to exceed $500 for an ordinary school year.

While enrolled in and pursuing a course under this law, such veterans may be paid a subsistence allowance of $50 per month if without dependents or $75 per month with dependents.

Veterans eligible for these educational courses are considered to be those whose education or training was impeded, delayed, interrupted, or interfered with by reason of his entrance into the service or who desires refresher or retraining courses. It is provided further that any person who was not over 25 years of age at the time of entering service shall be deemed to have had his education or training impeded, delayed, interrupted, or interfered with.

The bill also provides for on-the-job training in industrial plants; however, no provision is made for payment to industrial trainers. Minimum wages need be paid only when productive work begins. Exemption from standard wage-hour laws may be obtained from vocational rehabilitation officers of the Veterans Administration.

Excerpts from Public Law No. 16, 78th Congress, March, 1943

Public Law No. 16 applies only to disabled veterans It establishes eligibility for rehabilitation and restoration of employability by vocational training or by on-the-job industrial training. It provides for the payment during training periods of subsistence plus family allowance in addition to the basic pension which is determined by the percentage of disability. Normally the percentage per month roughly amounts to about $1 per 1 per cent of disability. The subsistence allowance was originally set at about $80 per month but was to have been increased to $92. Family allowance amounts to $10 for wife plus the same amount for each child or dependent parent.

Under this law tuition may be paid to an approved training institution for a maximum period of four years. All expenses are paid for such courses.

No period of training is set for on-the-job training courses. During the training period the veteran may start with no wages but if wages are allowed with increased productivity he is entitled to keep all wages paid until the pension plus wages exceeds normal wages for the position. At such time the increased pension allowed for training program is decreased, but in any event the regular disability pension continues.

WASHINGTON, D. C.

To realize fully the critical man-power situation confronting the ceramic industries, read the article by Arthur S. Watts in this issue, pp. 305–306.

NEW FACTS REGARDING OKLAHOMA RAW MATERIALS FOR THE CERAMIC INDUSTRIES*

By A. L. Burwell and W. E. Ham†

Abstract

The status of available information on glass sands, limestone, and dolomite in Oklahoma is summarized, with especial emphasis on their relation to the ceramic industries and to the availability of auxiliary materials and fuel. Analyses and distributions of these materials are given, and locations are shown on an accompanying map.

I. Introduction

Recent investigations by the Oklahoma Geological Survey reveal large deposits of high-grade glass sand, limestone, and dolomite in the State which to date have been only partly exploited. The purpose of this paper is to present a summary of the available information, including representative chemical and physical analyses, location of the deposits, and their geologic occurrence. The geographic distribution of the deposits is shown in Fig. 1.

* Forty-Seventh Annual Program, The American Ceramic Society, Inc., 1945 (Structural Clay Products Division Supplementary Title). Received March 22, 1945.

† Chemical engineer and geologist, respectively, Oklahoma Geological Survey, Norman, Okla.

II. Glass Sands

New information has been obtained on the geology, location, thickness, and extent of deposits in the north-central Arbuckle Mountain district, based upon field work done during the summer of 1944. The principal deposits are in the Oil Creek formation and the McLish formation, of Ordovician age, which correlate with the St. Peter sandstone of Illinois, Missouri, and Arkansas. Results obtained from this recent investigation will be published in a forthcoming Circular of the Oklahoma Geological Survey.[1] Certain facts from this report are given herewith.

[1] W. E. Ham, "Geology and Glass Sand Resources, Central Arbuckle Mountains," Oklahoma, *Okla. Geological Survey Bull.*, No. 65. In press.

Fig. 1.—Geographic distribution of Oklahoma deposits.

TABLE I

(A) CHEMICAL ANALYSES OF GLASS SANDS

Plant No.	Formation	Sample	SiO_2	Al_2O_3 (*et al.*)¶	Fe_2O_3	CaO	MgO	H_2O**	Ignition loss	Total
1	Oil Creek	Quarry face*	99.57	0.25	0.09	0.02	0.06	0.08	0.17	100.22
1	Oil Creek	Plant run†	99.87	0.04	0.03	0.01	0.01	0.01	0.08	100.05
2	Oil Creek	Quarry face‡	99.44	0.30	0.12	0.027	0.055	0.063	0.13	100.13
2	Oil Creek	Plant run†	99.83	0.09	0.04	0.007	0.001	0.017	0.05	100.03
3	McLish	Quarry face§	98.25	0.85	0.29	0.08	0.006	0.16	0.36	100.07
3	McLish	Plant run‖	99.83	0.054	0.044	0.02	0.004	0.00	0.09	100.04

* 62-ft. face. † Washed. ‡ 35-ft. face. § 50-ft. face. ‖ Washed and tabled, plus flotation. ¶ R_2O_3 less Fe_2O_3. ** Loss on drying at 105°C.

(B) SIEVE ANALYSES OF GLASS SANDS (CUMULATIVE)

			Tyler sieve No.								
Plant No.	Formation	Sample	32 Coarse sand	42	60 Medium sand	80	115 Fine sand	170	250 Very fine sand	325 Coarse silt	−325
1	Oil Creek	Quarry face*		0.1	3.2	18.7	62.5	78.7	86.5	92.8	99.6
1	Oil Creek	Plant run†		0.2	3.1	19.6	71.8	89.5	98.0	99.8	
2	Oil Creek	Quarry face‡		0.1	2.0	16.3	69.4	85.9	91.4	96.6	99.9
2	Oil Creek	Plant run†		0.1	1.3	13.6	71.3	89.1	95.5	99.9	
3	McLish	Quarry face§	0.2	1.4	7.0	19.9	66.9	86.1	95.9	99.6	99.9
3	McLish	Plant run‖		1.0	5.6	16.0	64.2	84.3	95.5	99.8	

* 62-ft. face. † Washed. ‡ 35-ft. face. § 50-ft. face. ‖ Washed and tabled, plus flotation.

TABLE II

CHEMICAL ANALYSES OF LIMESTONE AND DOLOMITE

Material, source, thickness	$CaCO_3$*	$MgCO_3$†	CaO	MgO	K_2O	Na_2O	SiO_2	R_2O_3	Fe_2O_3	Al_2O_3‡ (*et al.*)	P	S	H_2O§	Ignition loss‖	CO_2¶
St. Clair limestone. Channel sample, 65-ft. quarry face. Sec. 13, T. 13 N, R. 23 E, Sequoyah County	96.75	3.01	54.21	1.44			0.16	0.148	0.062	0.087	0.003	0.046		43.84	44.05
St. Clair limestone. Channel sample, outcrop 55 to 135 ft. below top of formation. Sec. 14, T. 13 N, R. 23 E, Sequoyah County	85.13	14.54	47.70	6.95			0.076	0.228	0.082	0.146	0.011	Slight trace		44.62	44.85
Royer dolomite. 125-ft. outcrop. Sec. 13, T. 3 S, R. 4 E, Johnston County	54.92	44.19	30.77	21.13	0.030	0.024	0.26	0.31	0.125	0.19	0.001	0.013	0.19	47.49	
Royer dolomite. 125-ft. outcrop. Sec. 10, T. 2 S, R. 4 E, Johnston County	54.90	43.73	30.76	20.91	0.075	0.035	0.53	0.38	0.160	0.22	0.001	0.008	0.17	47.30	
Royer dolomite. 169-ft. outcrop. Sec. 26, T. 2 S, R. 4 E, Johnston County	54.58	44.24	30.58	21.15	0.063	0.023	0.50	0.38	0.166	0.21	0.002	0.016	0.17	47.44	
Royer dolomite. 231-ft. outcrop. Sec. 36, T. 2 S, R. 4 E, Johnston County	54.76	44.44	30.68	21.25	0.053	0.028	0.30	0.33	0.150	0.17	0.002	0.010	0.05	47.34	
Royer dolomite. 75-ft. outcrop. Sec. 15, T. 2 S, R. 4 E, Johnston County	54.94	43.98	30.78	21.03	0.049	0.044	0.50	0.40	0.176	0.22	0.002	0.022	0.20	47.36	
Royer dolomite. 66-ft. outcrop. Sec. 2, T. 3 S, R. 4 E, Johnston County	54.95	44.63	30.79	21.34	0.040	0.025	0.29	0.35	0.154	0.20	0.002	0.010	0.07	47.44	

* Calculated from CaO. † Calculated from MgO. ‡ R_2O_3 minus Fe_2O_3. § Loss at 105°C. ‖ Loss at 950°C. ¶ Knorr alkalimeter.

TABLE III

VALUE OF NATURAL GAS PER 1000 CUBIC FEET*

	Oklahoma	West Virginia	Pennsylvania	Ohio	New York
Avg. value at well	$0.029	$0.112	$0.223	$0.164	$0.245
Avg. value at points of consumption	0.110	0.246	0.420	0.527	0.740
Avg. price paid by commercial consumers	0.271	0.335	0.530	0.559	0.708

* From U. S. Bureau of Mines Minerals Yearbook, 1943.

Three quarries are in production at the present time, and a fourth is expected to begin operations during 1945. Present production is estimated roughly at 130,000 tons per year. All quarries use hydraulic mining methods. The crude sands are beneficiated mainly by washing, with additional treatment by tabling and flotation in one plant. Sand is supplied to glass plants at Sapulpa, Sand Springs, Okmulgee, Henryetta, Ada, and Blackwell, Oklahoma, and Wichita Falls, Texas. Samples of the quarry faces and of plant-run material were taken by members of the staff of the Oklahoma Geological Survey, and analyses were made in the Survey laboratories. Table I gives the results of both chemical and sieve analyses.

III. Limestone

The geology, location, and extent of high-calcium limestone and dolomitic limestone in the Marble City area of Sequoyah County are described by Ham and others.[2] This is the St. Clair limestone of Silurian age. It is being quarried and stone is shipped to kilns at Sallisaw for calcining. Fines are shipped to Bauxite, Arkansas, for use in alumina extraction by the lime-sinter process. Fines are also used for concrete aggregate and for agricultural purposes. None of this stone is used for glassmaking, although the analyses indicate it to be superior to that now used in this area. On the basis of chemical composition, the St. Clair is divisible into thick high-calcium zones and dolomitic zones. Analyses are shown in Table II.

IV. Dolomite

There are several deposits of high-magnesium limestone in the Arbuckle and Wichita Mountain districts, but the most accessible, and apparently the highest-grade material, is the true dolomite located near Mill Creek, Johnston County. This deposit, the Royer dolomite of Upper Cambrian age, with an outcrop about one-half mile wide, ten miles long, and 550 feet thick, has been mapped in detail and sampled during the past two years. Results of this work will be published in a forthcoming report of the Oklahoma Geological Survey.[3] There is no production of dolomite at this time, but a number of potential quarry sites have been observed within two and one-fourth to three miles of a railroad. Representative analyses of carefully sampled outcrops are shown in Table II.

V. Auxiliary Materials

Lead oxide is produced in the Tri-State zinc-lead area which includes northeastern Oklahoma, southeastern Kansas, and southwestern Missouri. Feldspar is obtainable from Colorado, at least until such time as it is determined whether or not suitable feldspar can be separated from Oklahoma coarse granite. Three alkali plants producing a major portion of the soda ash of the country are located at Baton Rouge and Lake Charles, Louisiana, and Corpus Christi, Texas, all of which are within reasonable transportation distance. High-purity sodium sulfate is produced from natural brines at Monahans, Texas.

The most important auxiliary material, however, is fuel. There is an extensive coal-mining industry in Oklahoma, both low- and high-volatile coal being produced in the mining areas of east-central and northeastern Oklahoma. The average price in 1942 was $2.84 per ton f.o.b. the mines. Large amounts of natural gas are produced in many parts of the State, and it is available in most parts through a network of distributing lines. Table III gives comparative prices for natural gas. A mineral map of Oklahoma showing known occurrences of various minerals, and oil, gas, and electric-power distributing lines can be obtained free by writing to the Oklahoma Geological Survey at Norman, Oklahoma.

VI. Conclusion

Large reserves of glass sand, limestone, and dolomite are known within the state of Oklahoma, which are of high purity and meet the high standards of the ceramic industries. Auxiliary materials are available within a reasonable radius. An advantageous condition exists regarding natural gas for fuel.

[2] W. E. Ham, R. H. Dott, A. L. Burwell, and M. C. Oakes, "Geology and Chemical Composition of the St. Clair Limestone Near Marble City, Oklahoma," *Oklahoma Geol. Survey Mineral Rept.*, No. 16, 24 pp. (1943).

[3] W. E. Ham, "High-Grade Dolomite in the Mill Creek-Ravia Area, Johnston Counto, Vklahoma." Manuscript in preparation.

OWENS-CORNING TO OPERATE TWO NEW PLANTS

The Owens-Corning Fiberglas Corporation has announced that one plant in Kansas City, Kans., and another plant in Kansas City, Mo., have been taken over for the manufacture of Fiberglas. The entire operation will employ about 1500 men.

One of the most important uses of the Fiberglas produced will be for life jackets to replace kapok, which originally came from the Pacific Islands. Fiberglas has all the properties of kapok and in addition is fireproof and resistant to fungus growths. The Navy Department, which will take the entire output, says that these superfine glass fibers are far superior to natural fibers.

Many other uses, especially in aircraft insulation, give this material a large postwar future and assure the continued operation of these plants.

COMMITTEE REPORTS*

REPORT OF COMMITTEE ON PUBLICATIONS

The following report covers the activities of the Committee and also a summary of the status of the publications of The Society during 1944.

I. Activities of the Committee

Several problems were brought before the Committee for discussion. The statements of the problems and the conclusions drawn are given in the following paragraphs.

(A) Separate Issue of a Publication for the Constitution and By-Laws

The consensus of the Committee indicated that the Constitution and By-Laws should be published in a separate number of *The Bulletin* in order to be more readily available to the membership.

The Board of Trustees plans to have a pamphlet with the Constitution available in the near future.

(B) Section in Ceramic Abstracts on Manufacturers' Literature

Action in this direction was definitely discouraged. It was felt that any item of manufacturers' literature worthy of abstracting could be abstracted and placed in the proper section of the existing arrangement.

(C) Revised Style Sheet for Authors

The style sheet is a listing of words which are often misspelled, hyphenated, capitalized, etc.

The Committee felt that either a style sheet as used by a larger organization, such as the American Chemical Society or A.I.M.M.E., could be adopted or that a special committee of grammarians should be appointed to prepare a new style sheet.

(D) New Instruction Sheets for Abstracters

Considerable comment has been made by those persons who review literature that the *Ceramic Abstracts* have been of comparatively poor quality in recent years. It was suggested that the methods of abstracting used in the late twenties and early thirties were more satisfactory.

It was suggested that the abstracters should receive a more complete set of rules and instructions such as those furnished by *Chemical Abstracts*.

(E) Clarification of The Society's Policies re Publications

A controversy concerning the policies of The Society with regard to releasing papers either before or after the Annual Meeting for publication and review elsewhere caused a great deal of discussion which resulted in writing the policies listed in the attached Appendix II which is being presented to the Board of Trustees for approval.

II. Status of the Publications

(A) Costs of Publication

A 10% increase in cost of photoengravings for *The Bulletin* and *The Journal* became effective May 1 due to increased costs to the Mack Printing Company.

A 10% increase in schedule of rates to the Mack Printing Company for printing *The Bulletin* and *The Journal* was approved by the Board of Trustees and the Committee on Publications. This increase became effective with the January, 1945, issues.

(B) Papers and Pages Published

The report in Tables I and II on the publications of The Society was furnished by the editorial office.

The data show a healthy growth in number of papers published during 1944 compared with the number published in 1943. The larger publication, however, had had the following reaction as noted by Miss Van Schoick: "A shortage of papers for *The Journal* existed at the time the above data were compiled (March 31, 1945). A checkback shows that in 1944, 63% of the published papers in *The Journal* and *Bulletin* were received in the current year, 1944; in 1943, 57% of the papers were taken from the current receipt. The shortage of papers then seems to be the result of a decreasing supply of papers combined with 'overpublication' of material during 1944." The data shown in Table III show that there were more papers published in 1944 than there were papers presented at the 1944 Meeting.

The total number of pages published in 1944 was 1010 as compared with 863 in 1943. This increase in number of pages was made possible, even in face of the paper curtailment, by using 45-pound paper rather than the usual heavier grades. As a matter of fact, approximately two tons of paper was saved.

During the current year, the Design, Enamel, Glass, Structural Clay Products, and White Wares Divisions showed a good increase in number of papers published. The other Divisions either showed no gain or a loss.

—R. L. STONE, *Chairman;* R. E. BIRCH, H. ZANE SCHOFIELD, HARRY THIEMECKE, AND R. C. PURDY, *ex officio*

TABLE I

COMPARISON OF PAGES PUBLISHED IN *Bulletin* AND *Journal*

Total papers recd. (1944–1940)	Total No. of papers and pages *Journal* Papers	*Journal* Pages	*Bulletin** Papers	*Bulletin** Pages	Grand total Papers	Grand total Pages
1944 110	68	401	62	509	130	1010
1943 101	61	429	41	434	102	863
1942 138	74	479	43	331	117	810
1941 139	64	402	65	478	129	880
1940 138	61	366	57	501	118	867

* *Bulletin* totals (pages) include papers, activities, and notes.

TABLE II

BREAKUP BY DIVISIONS OF PAPERS PUBLISHED IN *Bulletin* AND *Journal*

Division	1944 *Journal*	1944 *Bulletin*	1943 *Journal*	1943 *Bulletin*
Design	3	11		8
Enamel	6	11	8	6
Glass	23	7	13	5
Materials and Equipment	3	5	11	8
Refractories	9	10	15	2
Structural Clay Products	2	6	3	3
White Wares	17	7	6	5
Miscellaneous	1	9	4	5

Appendix I

Recommendations

(Submitted as part of the Committee Report)

The following recommendations are presented to the Board of Trustees:

(1) That a special committee of grammatically inclined ceramic engineers, responsible to the Committee on Publications, be appointed to prepare an extensive and acceptable style sheet for The American Ceramic Society.

(2) That a special committee, responsible to the Committee on Publications, be appointed to prepare a revised set of instructions for Ceramic Abstracters.

(3) That the Rules Committee of The Society be asked to clarify the fourth paragraph of the Rules of The Society, Article R XII, Subsection (*k*) (adopted in 1939), with respect to the Procedure of Editorial Committees, Section

* For other Committee reports, see the June and July, 1945, *Bulletins*, pp. 212–19 and 253–65, respectively.

TABLE III

SOURCE OF PAPERS PUBLISHED IN 1943 AND 1944

Division	Papers listed at Meeting	Papers published	Year papers were read which were published in current year				Year papers were received which were published in current year			
			1941	1942	1943	1944	1941	1942	1943	1944
			Year 1943							
Enamel	11	14	1	5	8			5	9	
Glass	22	18	1	8	8		1	10	7	
Materials and Equipment	15	19		7	10			6	13	
Refractories	17	17	2	6	6			5	12	
Structural Clay Products	9	6		2	3			3	3	
White Wares	12	11		3	2			4	7	
Design	21	8		8				8		
Miscellaneous		9			5			2	7	
Totals	106	102	4	39	42		1	43	58	
			Year 1944							
Enamel	15	17		6	1	10		3	5	9
Glass	27	30		4	12	11			16	14
Materials and Equipment	10	8			1	7			1	7
Refractories	24	19		1	1	17			2	17
Structural Clay Products	18	8			2	6			1	7
White Wares	20	24	4		7	10			7	17
Art	7	14		1	7	5		1	9	4
Miscellaneous		10				7	2		1	7
Totals	121	130	4	12	31	73	2	4	42	82

IV, of "Rules for Presentation and Preparation of Papers at Technical Sessions of The American Ceramic Society," published in *Bull. Amer. Ceram. Soc.*, **24** [1] 37 (1945).

(4) That the following be referred to the Rules Committee of The Society for consideration as an amendment to the Rules: Papers, reports, written discussions, or other writings become the property of The Society on the date that the abstracts, title, or letters signifying intent are received in the editorial office. (The disposition of this property remains in the hands of the Committee on Publications.)

Appendix II

Policies Re Papers and Authors for the Committee on Publications

(*Submitted for separate action*)

The Committee on Publications presents the following policies on publications for approval by the Board of Trustees. These policies are for use by the Committee in clarifying the activities of Program Chairmen and Editorial Committees and are to be considered as a supplement, not an amendment, to Article R XII, Subsection (*j*), of the Rules of The Society.

(*A*) *Publication Privileges*

(1) Printing of abstracts of papers or other writings which have become the property of The Society, prior to presentation, will be permitted only when the abstracts are limited to the abstracts which appear in the printed program.

(2) Printing of digests (not to exceed 500 words) of papers or other writings will be permitted in publications other than those of The Society subsequent to the presentation of the paper, the summaries to be approved by either the Editor or the Committee on Publications before being printed.

(3) Papers will not be accepted for presentation at an Annual American Ceramic Society Meeting if they have appeared or are to appear elsewhere in English except when published in the official organ of the organization sponsoring the research (i.e., papers which have been committed for publication elsewhere will not be accepted except as noted).

(4) Papers will not be accepted for publication by The Society if they have been or will be published in English elsewhere.

(5) Excerpts from papers or other writings appearing in the publications of The Society may be printed elsewhere only when permission is granted by either the Editor or the Committee on Publications of The Society.

(*B*) *Qualifications of Acceptable Papers for Presentation*

The following are qualifications of papers acceptable for publication in *The Journal* and *Bulletin:*

(1) Scientific papers which report the results of original fundamental research and extend the fund of basic knowledge concerning ceramic materials, reactions, and processes.

(2) Semiscientific or technical papers which report the results of research, experimental, or development work in fields of which there is basic knowledge. Such papers will add to that knowledge and perhaps indicate methods of application to practice.

(3) Engineering papers which report the manner in which scientific knowledge has been applied to the problems of the ceramic industry in the utilization and application of various materials and improvements or developments in processes and equipment.

(*C*) *Basis of Rejection of Papers*

The Editorial Committees of the several Divisions will base rejection of papers on the following grounds:

(1) The subject matter does not fall within the scope of the foregoing qualifications.

(2) The paper contains matter readily found elsewhere.

(3) The contents are of an advertising character.

(4) The subject matter is not new.

(5) The treatment is seriously defective as to literary form and structure, continuity of thought, clarity of expression, etc.

These policies do not prevent trade publications from printing their own discussions or interpretations of papers either before or after presentation of the papers. Neither do they set up the mechanics whereby the publishers of trade magazines obtain their summaries. Neither do they prevent trade magazine publishers from requesting permission to print papers presented to The American Ceramic Society, but disposition of all papers is still in the hands of the Committee on Publications.

Item (*A*) (1) is an alteration of the published Rules and should appear as an amendment. All other items are interpretations of existing Rules.

The items of (*B*) are excerpts from a letter by J. L. Carruthers, *Chairman*, Special Committee on Publications, to his Committee on March 28, 1945.* The items of (*C*) previously appeared in "Rules for Presentation, etc.," *Bull. Amer. Ceram. Soc.*, **17** [1] 30 (1938).

* A report of the Special Committee on Publications appears on p. 262, July, 1945, *Bulletin*.

REPORT OF COMMITTEE ON MEMBERSHIP

Membership Goal

The over-all increase of 14% in Personal Membership and 21% in Corporation Membership is recorded despite normal wartime losses (including the loss of 60 student members) due to members entering the military services. This commendable record is the result of the efforts of the officers, the members of the Membership Committee, and those individuals without official committee status who unselfishly devoted their time to the personal solicitation of new members. Special commendation is due the Membership Committee of the Glass Division for its extraordinary achievement during the past year. Its success should stand as evidence of what can be accomplished with the proper effort and should be a challenge to all other Divisions.

An original goal of 5000 members[1] by 1947 would seem to be more than can be attained on the basis of the results of the past, but it is hoped that new plans which are being formulated may facilitate progress. The potential membership which The Society could serve is far in excess of the immediate goal of 5000. Thus the problem of increasing membership resolves itself into (1) a study of ways by which The Society can provide the services most needed by the current and potential members and (2) a program of membership solicitation which will insure the proper contacting of the prospective members. Some of the factors which have a direct bearing upon the success of future membership efforts will be discussed in the remainder of this report.

Divisional Membership Committee

The Membership Committees of the past, as directed by the By-Laws,[2] have consisted of a chairman and a representative of each Division (7) and of each Class (2). This ten-man Committee, along with appointed subcommittees in some cases, has functioned as well as could be expected in view of the method of selection and the inability of some members thus appointed to make the effort required for adequate solicitation of any appreciable portion of the prospective members. Furthermore, the annual change in Committee personnel in most cases is not conducive to the long-range development necessary. Continuation of the same Membership chairman through two or three administrations is a constructive step, but this practice should also be more common in Divisional Membership appointments. It is also highly desirable that in the future the Division chairman exercise extreme care in the selection of Divisional representatives for the Membership Committee of The Society.

It is suggested that attention be given to a plan which will promote continuity of membership effort by means of less frequent changes in Committee personnel. In addition, it is suggested that all Divisional officers and Membership representatives recognize the opportunity which lies ahead for strengthening of their respective Divisions and The Society through conscientious work on membership. The success of the Glass Division during the year in showing a net gain of 93 Personal and 31 Corporation Members is concrete evidence of what can be accomplished by an active program of solicitation which, despite its success, was not an undue burden upon any individual.

Territorial Membership Organization

Intimate contact with prospective members is necessary to successful membership solicitation in a majority of cases. This contact should be as personal as possible, whether it be by visit or correspondence. One inevitable deficiency of most Divisional Membership Committees is their lack of opportunity to realize the number of personal contacts necessary for best results. Resort to form letters is the only alternative in most cases. To supplement the work of the Divisional Membership Committee, it is hereby proposed that a Territorial Membership Organization be formed. The general plan for such an organization is already formulated and a questionnaire designed to assist in the selection of personnel should soon reach all members of The Society.

The final character of this Territorial Organization has not been determined. Briefly, however, the entire United States will be divided into twenty or thirty districts. The territories will vary greatly in size according to the number of current and potential members in different sections of the country. Each such territory will be headed by someone conscientiously interested in the welfare of The American Ceramic Society, who will also be a member of the Territorial Membership Committee. The personnel of this organization will not change annually except according to expediency, and thus the desired continuity of effort will be maintained.

The objective, of course, is close and continuing contact with all prospective members. It is hoped that a skeleton Territorial Committee will be functioning within a few months and that the main organization will be complete by the Annual Meeting time in 1946.

No By-Law change would seem to be required at present to cover this Territorial Committee, because it is not in conflict with the official Membership Committee representing the Divisions and Classes. It is requested, however, that the Board of Trustees take official action which will determine the future disposition of this proposed plan. If approved and organized successfully, a By-Law provision for this Committee may be in order at a later date.

Local Sections

The successful growth and continuing activity of existing Local Sections and the development of new ones in selected centers of ceramic enterprise are of direct interest to the Membership Committee. The plans for Local Sections are covered by separate reports, so it suffices to say that the Membership Committee strongly supports all plans for the improvement of existing Local Sections, for increased cooperation between Local Sections and The Society, and for the organization and promotion of new Local Sections in those territories where The Society's membership or interest in ceramics is sufficient.

Secretarial Assistance on Membership Activities

Membership is admittedly one of the most important phases of The Society's activities. To neglect any part of this activity through insufficient attention to detail will impede the growth and strengthening of The Society.

The current activity and proposed plans of the Membership Committee require secretarial assistance. It is therefore proposed that plans be made immediately for the provision at Headquarters of a person with stenographic training whose first responsibility shall be the handling of membership details as determined by the Membership Chairman and the Secretary. Among the duties of this assistant might be listed: preparation and maintenance of up-to-date lists of membership prospects of different types; maintenance of accurate membership files at Headquarters and in the hands of interested individuals; correspondence with new or prospective members regarding details of a membership; preparation of monthly membership reports in detail, and distribution as specified; preparation and distribution of any general or form letters pertaining to membership, including some letters of solicitation by membership workers; preparation of charts showing past and current membership trends; handling of miscellaneous correspondence as becomes necessary; keeping the Membership Chairman and others posted of any membership problems which come into the office; correspondence with delinquent members; assistance with collection of annual dues. The need for at least one staff assistant to handle membership to the extent required is quite evident. The provision of a membership assistant as recommended does not necessarily mean that

[1] R. Russell, Jr., "Report of Committee on Membership," *Bull. Amer. Ceram. Soc.*, **23** [5] 169–70 (1944).

[2] "By-Laws, The American Ceramic Society," *ibid.*, **17** [10] 390 (1938).

MEMBERSHIP SUMMATION

	Members paid or deferred		Members unpaid		Sub-scriptions	Monthly sales	Total circulation
	Personal	Corporation	Personal	Corporation			
March 23, 1944	1844	323			523	220	2910
March 21, 1945	2103*	391	(556)	(20)	688	220	3402
12-month change	259	68			165		492
% change	14	21			32		17

PAID MEMBERSHIP, MARCH 30, 1945

Division	Persona	Corporation
Design	78	6
Enamel	187	51
Glass	420	96
Materials and Equipment	136	47
Refractories	474	69
Structural Clay Products	123	28
White Wares	407	88
Professors	71	0
All Divisions	20	3
No Division	82	3
Students	121	0
Total	2119*	391

* Adjustment in count on March 30, 1945.

all of the foregoing duties will be assigned to the one individual selected, for some of these duties will undoubtedly require the attention of other staff workers.

Since the staff assistant will add to the already increasing membership and will at the same time provide for much better relations between members, prospective members, and The Society, it is recommended that action be taken to authorize a membership secretarial assistant at the Headquarters Offices.

Membership Application Cards

One difficulty with which membership workers must always contend is the provision of clear, concise information relative to the details of membership application. Correspondence by membership workers and the office staff with prospective and new members is much more voluminous and time-consuming than is desirable. Moreover, the effect of doubt and confusion is the minds of membership prospects regarding details such as prorating, publications, starting dates, privileges, etc., is certainly detrimental.

It is believed that the currently used application cards for both Personal and Corporation Members should be revised to provide the answers to the most pertinent questions confronting a prospective member.

Society Prospectus

A recommendation was made to the Board at the 1944 Annual Meeting[1] that a prospectus worthy of our Society be prepared for its advertising value and to aid in procuring new members. Such a prospectus would be attractively designed and would outline in concise form the interest and functions of The Society and provide membership data along with other general information pertinent to prospective members. It is again suggested that arrangements be made for preparation of an adequate prospectus of The Society at an early date.

A prospectus covering the scope and functions of The Society was prepared and published in *The Bulletin*.[3] Reprints of this prospectus in single-sheet form are available for use by any member. Requests should be directed to the Headquarters Office. This particular publication is only meant for temporary use until a more suitable prospectus is made available.

Solicitation by Current Membership

It is hoped that more can be done to obtain a greater degree of cooperation from the current membership in the solicitation of new members. This group represents a potential country-wide membership organization, and one which, with the proper incentive, could accomplish a maximum increase in membership with a minimum of time and effort. The problem of how to impress a large majority of members with the importance and desirability of selling membership is one which has not been solved. It is true that the work of some individuals on behalf of The Society membership is most commendable, but the number of such individuals is quite small. Means will be sought to obtain the cooperation of more individuals, and the proposed Territorial Committee will be a step forward. Other methods to insure wider cooperation are needed, however, and the Membership Committee welcomes any suggestions.

Corporation Members

The Board of Trustees on December 8, 1944,[4] approved an increase in all Corporation dues to $50 annually, to become effective January 1, 1946. When this change is effected, there will probably be some loss of Corporation Members, which it is hoped will be minor. This does, however, pose a problem for the Membership Committee.

—RALSTON RUSSELL, JR., *Chairman*

[1] R. Russell, Jr., "The American Ceramic Society, Its Scope and Functions," *Bull. Amer. Ceram. Soc.*, **23** [9] 294–95 (1944).

[4] "Meeting of Board of Trustees, December 8, 1944," *ibid.*, **24** [1] 23–26 (1945).

REPORT OF SPECIAL COMMITTEE ON STATUS AND ACTIVITIES OF THE FELLOWS OF THE AMERICAN CERAMIC SOCIETY*

The following Constitutional changes are recommended†:

Article III. Membership

Section (1) (*c*): Fellows shall be persons of at least thirty years of age who shall have been Members at least five years and who shall prove qualified for elevation to the grade of Fellow by reason of outstanding contributions to the ceramic arts or sciences. They shall be elected by the Board of Trustees in the manner provided in the By-Laws. Fellows shall be entitled to use the title "FELLOW OF THE AMERICAN CERAMIC SOCIETY" or the abbreviation "F.A.CER.S."

Article IX. Fellows

Delete in its entirety.

Article B III. Membership

Delete (1) (*a*) and substitute the following:

Honorary Members shall be elected by the unanimous affirmative vote of the Board of Trustees. Nominations will be made to the Board by a committee consisting of the chairmen of the Divisions of THE SOCIETY.

(1) (*c*) Delete present Subsection and substitute the following:

Members who meet the basic requirements set forth in Article III, Section (1) (*c*), of the Constitution are eligible for election by the Board of Trustees to the grade of Fel-

* Special Committee appointed by President Fritz October 26, 1944, by authorization of the Board (see *Bull. Amer. Ceram. Soc.*, **24** [1] 24 (1945)).

† These proposed amendments are now in force (see p. 316, this issue).

low. A two-thirds vote of the Board of Trustees will be required for election after consideration of the following specific requirements:

(i) A candidate must have a good personal reputation and have won recognition for outstanding or notable contributions to the ceramic arts and sciences in one or both of the following fields of endeavor:

(1) Broad and productive scholarship in ceramic science and technology as evidenced by (*a*) the publication of articles and books of merit on ceramic work supervised or done by the nominee, (*b*) the granting of patents to the nominee on scientific and technical developments in materials, process methods, or equipment in various fields of ceramics, (*c*) direction of important research, engineering work, or ceramic activity as judged by the nominee's position in the industry and the contributions of those working directly under him.

(2) Conspicuous achievement in some branch of the ceramic arts as evidenced by (*a*) the creation of ceramic works of art which have won awards at exhibitions of recognized high standing, (*b*) a position in educational or industrial fields recognized as influential in the creative ceramic arts.

Outstanding service to THE SOCIETY shall also be considered in rating nominees who are otherwise qualified.

(ii) The method of nomination of candidates shall be as follows:

(1) (*a*) Nomination for elevation to the grade of Fellow shall be made on forms approved by the Board of Trustees as provided in the Rules. Nomination shall be made by seven or more Fellows or Members acting as sponsors. At least four of the sponsors shall be members of the Division with which the nominee is affiliated.

(2) (*a*) The president of THE SOCIETY shall appoint a Panel of Fellows. It shall consist of nine previously elected Fellows representing as equitably as possible all Classes and Divisions of THE SOCIETY, to serve three years each or from the close of one Annual Meeting until the close of the third succeeding Annual Meeting. Their names shall be known only to the President and to each other and the transactions of the Panel shall be known only to the President and General Secretary.

(*b*) Each succeeding President, upon taking office, shall appoint three Panel members for a three-year term. The President shall fill all vacancies on the Panel by appointment at the time the vacancy occurs. Retiring Panel members shall not be eligible for reappointment until a period of three (3) years has elapsed, except that a Fellow appointed to fill an unexpired term is not disqualified for immediate appointment for a regular term.

(*c*) Each year the retiring President shall provide the newly elected President with the names of the members of the Panel of Fellows whose terms hold over, and the new President shall in turn notify the Panel members of his new appointees and advise the said appointees of the names of the holdover members.

(*d*) The President shall appoint as chairman of the Panel of Fellows one of the three members serving their last year.

(At the time of the adoption of this By-Law, the members of the Fellowship Board, authorized in Article III of the former Rules of the Fellowship, shall automatically become members of the Panel of Fellows for the term for which they were respectively appointed by previous Deans of the Fellows. The then-incumbent Dean shall disclose their names to the then-incumbent President. Their activities may thus continue without interruption and the rotation of personnel of the Panel will have been provided for. This paragraph of this By-Law shall be deleted from the By-Laws immediately after its adoption and publication.)

Article R III. Membership

(1) (*c*) Delete present Subsection and substitute the following:

(1) (*c*) (ii) (1) (*a*) Nomination for elevation to the grade of Fellow shall be made on forms approved by the Board of Trustees and made available through the office of the General Secretary. When properly executed and signed by the sponsors, the said forms shall be forwarded to the General Secretary who shall certify the Division affiliation of the nominee and, if such be the case, that at least four of the sponsors are members of the same Division.

The General Secretary shall prepare copies of the nomination papers and all supporting statements for each member of the Panel and forward them, together with the original papers, to the President 90 days before the opening date of the next Annual Meeting. Nominations received subsequently by the General Secretary shall be held over.

(2) (*a*) The President shall forward to the chairman of the Panel the nine copies of all properly executed nominations and any supporting statements within five (5) days of their receipt from the General Secretary, keeping the originals for his own use. The chairman of the Panel will at once send a copy to each member of the Panel.

Each member of the Panel shall return to the Chairman, not less than forty (40) days before the opening date of the next succeeding Annual Meeting of THE SOCIETY, all copies of nomination papers and supporting statements together with the names of these nominees he considers fully qualified for Fellowship, arranged in the order of his respective preference for them. The Chairman shall immediately select not over ten nominees receiving the highest rating by the members of the Panel.

The chairman of the Panel will then send the list of the selected nominees to the President, together with all supporting papers in connection with all nominations.

The President will then submit the list of the selected nominees to the Board of Trustees for vote as to election.

All but the original nomination papers of those elected by the Board of Trustees will be destroyed by the President. The original papers will be filed with the General Secretary.

The nomination papers, supporting statements, and copies thereof of those nominees not selected or elected shall be retained by the President and surrendered to the succeeding President immediately after his election. These nominees shall be again considered by the next succeeding Panel provided, however, that a nominee shall only be considered by three successive Panels and, if then failing of election, all papers and copies thereof shall be destroyed by the President.

Committees for Fellow Activities

In addition to the foregoing recommended Constitutional changes, the Committee recommends the following special committees:

Fellowship Funds

The Board of Trustees will appoint a committee of six Fellows representing as equitably as possible all Divisions of The Society, to decide upon disposition of funds accumulated to the credit of the Fellows and to supervise the authorized expenditures. The committee will elect its own chairman. The members will serve three years and rotate two members each year. Members will be eligible for reappointment.

Orton Lecturer

The Board of Trustees will appoint a special committee of three Fellows to select the Orton Lecturer for each year and make all necessary arrangements in connection therewith, in cooperation with the Secretary of The Society. The expenses in connection therewith will be borne by The Society.

—L. E. BARRINGER, *Chairman;* FRANCIS C. FLINT, W. KEITH MCAFEE, LOUIS NAVIAS, ROBERT B. SOSMAN, AND J. W. WHITTEMORE

THE PRESIDENT'S PAGE

COMMENT ON THE SLOGAN "DOUBLE THE MEMBERSHIP"

By C. Forrest Tefft

For the past two years there has been much discussion of increasing the membership of The American Ceramic Society. Many plans have been presented for securing new members, but as yet nobody has studied the problem and suggested what number we are trying to establish. Probably the best answer is the suggestion that the membership should be double the figure of 1942, i.e., about 4000 Personal Members and 500 Corporation Members. This number should be attained by the time The Society is fifty years old.

This is a pious wish, but is it based on a study of the product and the market? It is similar to the thought that I would like to produce one hundred million brick a year. This is a good thought, but I must find out several things about brick before I can attain that figure. First, I must know that I have enough raw material to produce that many brick for a number of years. Then I must determine the size of plant needed and, finally, if the market will absorb that many brick. Furthermore, I must guess whether a competitor will build a plant across the road.

Let us look at The Society from the same standpoint. First, how large should it be? We can start from the suggested figures. Suppose we say that we should have 3600 Personal Members and 600 Corporation Members.

At the present rate for Personal Members and the new rate for Corporation Members to be established next year, this number, with the miscellaneous income of The Society, would produce a total budget of about $100,000 a year. This amount would make possible the expansion of the services of The Society and make these services more desirable to a larger number of potential members.

We could add to the publications and increase the scope of the research that is necessary to bring more ceramic information to our members. We could do some of the service work that is being done by other successful organizations to make their offices the headquarters for their industries. We could give some attention to the schools and assist with the development of interest in ceramic education. We could sponsor an award for ceramic research.

We could assist Local Sections by providing touring speakers and publicizing meetings. We could help with the organization of Local Sections in areas where there are only a few members. We could set aside an amount each year to acquire our own building.

This is of utmost importance if The American Ceramic Society is to hold its present place in the industry when the membership is greatly expanded and more widely scattered.

This size of membership would probably be big enough to support ten more Local Sections, which would give The Society better geographical distribution. It would help us to be represented in the twenty-five schools where ceramic work is part of the curriculum.

There is, however, a top limit to the membership of The Society if it is to continue to be a "personal" organization. The top limit is near the figures that I have mentioned. Why is this limit necessary?

First, because we want to hold an Annual Meeting that will attract not more than 1500 members so that the place of such a Meeting need not be confined to a few large cities. Even our present membership makes it impossible to go to one or two desirable cities.

We should keep this in mind when we talk about greatly expanded membership.

Then, again, it still will be small enough to provide the personal acquaintanceship that is so necessary in a society. At present, we have seven industrial Divisions. With the indicated membership, this number may grow to ten. This means a maximum of five to six hundred members in any one Division. In such a group we can at least know a large minority of the attendants at a Meeting.

Let us look at that figure again—3600 Personal and 600 Corporations. Have we the potential membership for such a number? At least 4000 manufacturing companies in this country are interested in some ceramic product. About 700 ceramic engineers have been graduated in the last ten years, which probably indicates that there are two thousand men in the industry with either a ceramic engineering degree or the same status with another engineering degree. Operating men constitute a large portion of our membership now and that proportion could be larger. Yes, there is plenty of raw material.

How about competition? We have little at the present time. In fact, The American Ceramic Society is one technical society that speaks for the membership of an entire industry. Competition is not a factor.

How about the future market? We are just beginning to properly appreciate the value of ceramic products. The world has been metal-minded for the last two hundred years. In this time it has been war-minded also. Perhaps the next few years will see peace-mindedness when the real value of ceramic products is appreciated.

From where will our members come? Let us look at one source, the returning servicemen. Nearly five hundred of them are now on our list. They are expressing a continued interest in ceramics.

The building industry is beginning to come back to life. The enamel industry has nearly shut down during the war. The glass industry has only started to exploit the glass packaging field. The pottery industry will find its new designs welcome in every field of life, and the demand for structural clay products will probably total eighteen billion brick equivalents a year.

We have the raw material, the organization, and the market. Our "Sales Quota" should be easy to make.

LOCAL SECTION NEWS

NORTHWESTERN OHIO SECTION

The final meeting of a highly successful first year was held June 8, 1945, at the Mohawk Golf Club, Tiffin, Ohio, by the Northwestern Ohio Section of The American Ceramic Society, with 106 persons attending. This was a stag affair at which a large proportion took advantage of the opportunity to play the sporty Mohawk course.

Golf was followed by a dinner meeting in the clubhouse, presided over by A. H. Couch, Toledo, Chairman of the Section. Being the first meeting held in the southern part of the Northwestern Ohio region, Chairman Couch introduced the following Section officers and organizers: ROBERT TWELLS, Fostoria, *Councillor;* H. H. HOLSCHER, Toledo, *Vice-Chairman;* H. A. MCMASTER, Toledo, *Secretary;* A. H. NIEMAN, Woodville, *Treasurer* (newly appointed to succeed Howard Morison, who has left this region); and D. E. SHARP, Organizing Committee.

After the reading of the minutes of the April 25 meeting, H. H. Holscher presented an outline of next season's plans as tentatively arranged by his Program Committee.

Ross C. Purdy, General Secretary of The Society, congratulated the Section on completing a successful first year.

Fred Chambers, a member of the Section from Luckey, produced an abundance of laughs with a show entitled "Fun and Magic," the climax of which was the "rabbit-out-of-the-hat" trick. Ross Purdy was presented with the animal.

Mr. Twells introduced M. C. Booze, vice-president and general manager of the Charles Taylor Sons Co., Cincinnati, Ohio, who presented the technical phase of the program. This consisted of an informative talk and question box on refractories, their types, properties, and uses. After presenting his basic outline, Mr. Booze was ably assisted in elaboration by three of his associates, E. L. Bohn, Karl Smith, and E. G. Couch, Jr.

Mr. Twells and F. B. Carter of Tiffin cooperatively handled meeting arrangements, and C. L. Babcock, Toledo, made a photographic record of proceedings (see opposite column).

Visitors present included Chairman E. M. Sarraf and T. F. Stockslager of the Northern Ohio Section.

—H. A. MCMASTER, *Secretary*

PITTSBURGH SECTION

A meeting of the Pittsburgh Section was held June 12. Dinner was served to thirty-five persons at the Webster Hall Hotel. Following the dinner, a meeting was held at Mellon Institute, at which fifty-two were present.

The meeting was called to order by Chairman Harold E. Simpson, and the minutes were read and approved. The motion was passed asking the Secretary to write a letter of appreciation to the committee who provided the entertainment for the Spring Meeting in May. Paul Thompson reported as Chairman of the Relations Committee that the recommendations for better cooperation between the National Society and the Local Sections, presented at the Buffalo meeting (see the June, 1945, *Bulletin*, pp. 217–18), had been approved and acted upon favorably by the National Society.

Chairman Simpson then appointed committees for 1945 (see the July, 1945, *Bulletin*, p. 269).

Following the business session, E. E. Marbaker, who has a Fellowship at Mellon Institute with the O. Hommel Company, gave a very interesting well-illustrated talk covering "Coatings for Wire-Wound Resistors." His project was sponsored by the Office of Production Research and Development of the War Production Board under a contract of the O. Hommel Company. This discussion covered enamel and silicone coatings for wire-wound tubes of steatite and other ceramic bodies.

The Society was honored with the presence of Charles S. Pearce, Associate Secretary, from Columbus, Ohio, who spoke briefly at both the dinner and the meeting. Howard Koepke, of the Forter-Teichmann Company, Pittsburgh, Pa., was also introduced at the meeting. He had just returned from Germany, where he was a prisoner of war for nine months.

A plant inspection trip and outing is planned in the East Liverpool district for September. This will be an afternoon and evening affair and will probably be held Friday, September 14 or 21. The exact date will be announced later.

—HOWARD M. PARKHURST, *Secretary*

Ross C. Purdy and M. C. Booze
One of the photographs taken by C. L. Babcock at the June meeting of the Northwestern Ohio Section in Tiffin, Ohio.

WEST VIRGINIA SECTION ORGANIZED AT PARKERSBURG

At a meeting at the Stratford Hotel, Parkersburg, W. Va., June 22, the West Virginia Section of The American Ceramic Society was informally organized with W. R. Schlehr acting as chairman. Twenty-five members were present from Parkersburg, Huntington, and Morgantown, W. Va.; Columbus and Bellaire, Ohio; and Pittsburgh, Pa.

Ross C. Purdy, General Secretary, told of the history of The Society and how technical research work had been organized with the active aid of the management of many ceramic plants. He said that Local Sections had been most helpful in getting members acquainted so they could discuss materials and technical and operating problems.

Charles S. Pearce, Associate Secretary, presented the plans of The Society for postwar work, including more extensive meetings, redesigned and enlarged publications, and employment service for returning veterans.

C. Forrest Tefft, president of the Claycraft Co., Columbus, Ohio, and President of The American Ceramic Society, spoke of the good work which a Section could do in Parkersburg and endorsed the work of the local committee in organizing this group.

J. F. Lindsay of the Libbey-Owens-Ford Glass Co., Parkersburg, W. Va., said that such a meeting would be an informal gathering for the exchange of information between plantmen and technically minded engineers and scientists.

J. A. Alexander of the Corning Glass Works, Parkersburg, said that his Company was always interested in research and technical work and would give help to any efforts in this line.

M. H. Hunt of Porcelain Products, Inc., Parkersburg, brought eight foremen from his plant because he wanted

them to have the benefit of the local contact with technically minded men.

A. C. Ottoson of the Imperial Glass Corp., Bellaire, Ohio, suggested that they might need to organize a Section in Wheeling.

Mr. Schlehr closed the meeting by announcing another meeting in September or October.

BALTIMORE-WASHINGTON SECTION COMMITTEES FOR 1945-1946

(*For Executive Committee, see July, 1945, Bulletin, p. 269*)

Program Committee

JAMES B. WILLIS, *Chairman*, Pemco Corp., Baltimore, Md.

ANSEL S. CREAMER: National Bureau of Standards, Washington 25, D. C.

Membership Committee

WALTER A. WELDON, *Chairman*, Locke Insulator Corp., Baltimore 3, Md.

D. G. MOORE: National Bureau of Standards, Washington 25, D. C.

PAUL J. YAVORSKY: National Bureau of Standards, Washington 25, D. C.

A NEW YORK CITY LOCAL SECTION

The Board of Trustees of The American Ceramic Society has received a petition for the establishment of a Local Section in the area surrounding New York City, including a part of northern New Jersey and southern Connecticut. At a meeting held in New York July 18, 1945, an Organizing Committee was formed and the next meeting date set for Wednesday, September 5, 1945. The following members of The Society signed the petition: James B. Austin, James F. Barns, J. C. "Sam" Crawford, Cyril B. Delgado, Emerson W. Emrich, Frank J. Fallon, Perry C. McCollom, Joseph A. Pask, Robert H. H. Pierce, Jr., Elmer Rosenberg, and James D. Tetrick. Also included on the Organizing Committee are Robert M. Curts and C. C. Treischel.

NEW DIVISION OF SOUTHERN CALIFORNIA SECTION

A Design Division of the Southern California Section was organized July 16, 1945, at a meeting held in the auditorium of the Architecture Building, University of Southern California. About ninety were present, most of them interested in the design and production of artware.

Professor Glen Lukens of the University of Southern California opened the meeting with a statement of the purpose of the gathering and commented on the large number of art potters who were located in Southern California. Clare S. Chaffee of the Latchford-Marble Glass Co., Los Angeles, Calif., and Chairman of the Southern California Section discussed the organization of The American Ceramic Society and gave his ideas of how a Design Division could be of assistance to the art potters in the district.

William Manker of Scripps College, Claremont, Calif., spoke of the National Ceramic Art Exhibition which is held at Syracuse, N. Y. Mr. Manker stated that with the temporary discontinuance of the Syracuse exhibit, it would be an opportune time to have a Southern California exhibition which should be advantageous to all of the ceramists in this area.

C. Guy Wurtsbaugh of the Haldeman Potteries, Burbank, Calif., gave a talk on "Lead-Free Glazes" which, because of the present situation in the lead industry, was well received. Ross D. Plank of Gladding, McBean & Co., Los Angeles, Calif., followed Mr. Wurtsbaugh with a talk on "Factory Control of the Glaze Formula." Mr. Plank's talk demonstrated again how an organization such as The American Ceramic Society can be of service to the art pottery industry.

At the conclusion of the technical program, Mr. Manker was elected Chairman of the Design Division. Provision was made for a vice-chairman from the technical section of the industry and a vice-chairman from the design section. Mr. Manker appointed a Nominating Committee to submit recommendations.

The next meeting is scheduled for Monday, August 20, 1945, at which time the organization of the Division will be completed.

The Southern California Section of The American Ceramic Society now has not only a general division of its members with meetings on broad ceramic subjects, but also a division of members who are interested in the problems of glass. The organization of the Design Division will make two local groups interested in special problems of these branches of the ceramic industry.

ST. LOUIS SECTION COMMITTEES FOR 1945-1946

(*For Executive Committee, see June, 1945, Bulletin, p. 220*)*

Program Committee

PAUL G. HEROLD, *Chairman*, Missouri School of Mines, Rolla, Mo.

E. C. DEXHEIMER, National Enameling & Stamping Co., Granite City, Ill.

J. L. CRAWFORD, Walsh Refractories Corp., St. Louis 7, Mo.

Membership Committee

L. C. HEWITT, *Chairman*, Laclede-Christy Clay Products Co., St. Louis 16, Mo.

R. S. BRADLEY, A. P. Green Fire Brick Co., Mexico, Mo.

PAUL F. GUTMANN, Mississippi Glass Co., St. Louis 7, Mo.

Publicity Committee

W. H. DANKS, *Chairman*, Pittsburgh Plate Glass Co., Crystal City, Mo.

J. J. OFFUTT, A. P. Green Fire Brick Co., Mexico, Mo.

J. J. FITZGERALD, A. P. Green Fire Brick Co., St. Louis, Mo.

H. L. HERROD, Harbison-Walker Refractories Co., Vandalia, Mo.

Nominating Committee

J. C. HOSTETTER, *Chairman*, Mississippi Glass Co., St. Louis 7, Mo.

R. L. BLESSING, Laclede-Christy Clay Products Co., St. Louis 16, Mo.

W. P. CHARBONNIER, Walsh Refractories Corp., St. Louis 7, Mo.

* Since this listing V. E. Wessels, Secretary, has left the St. Louis district. A new Secretary will be elected at the October meeting of the St. Louis Section.

TRENTON CERAMIC ENGINEERS CLUB

The Trenton Ceramic Engineers Club of Trenton, N. J., held its monthly meeting June 7, 1945, at the home of L. B. Coffin of Lenox, Inc., Trenton, N. J. Approximately twenty members were present.

The first event on the program was a business meeting conducted by the president, G. W. Phelps of the United Clay Mines Corp., Trenton, N. J. The possibilities of a summer social affair were discussed; also the possibilities of the club becoming affiliated with The American Ceramic Society as an eastern branch.

The speaker of the evening, R. R. Danielson, of the Metal & Thermit Corp., Carteret, N. J., gave an informative paper on "Opacifiers." It dealt with opacifiers in general and "synthetic" (zirconia, principally) opacifiers in particular as applied to enamel and glazes. A lively half-hour discussion followed, during which refreshments were served.

The last event was a buffet luncheon.

—EDWARD J. SMOKE

CERAMIC ASSOCIATION OF NEW JERSEY

Attracted by an interesting program and an inviting meeting place, more than 125 persons attended the summer meeting of the Ceramic Association of New Jersey held at the Trenton Country Club, Trenton, N. J., June 15, 1945. The all-day meeting was a great success.

The morning session was devoted entirely to the presentation of the formal program. Following a few brief opening remarks by the president, Fred Bentley, an informative talk on "New Jersey's Little-Known Mineral Resources" was given by Carroll Lane Fenton, editorial consultant at Rutgers University and well-known author of several books pertaining to geology. Dr. Fenton pointed out that, although New Jersey is one of the smallest states in the Union, it ranks among the first fifteen in the production of minerals. His talk was illustrated with several interesting Kodachrome slides of various minerals found in this State. The need for investigative work in connection with many of the available minerals was emphasized and attention was called to the extensive minerals research proposed at Rutgers University.

An excellent talk on "Silicones" by Shailer L. Bass, of the Dow Corning Corp., Midland, Mich., highlighted the program. The group was acquainted with the formation, properties, application, and possible uses of this new material. Belonging to a new class of organic compounds, silicones can be considered as derived from sand, oil, coal, and brine. The actual formation of these silicoplastics is rather complicated, as their synthesis involves a number of steps. Dr. Bass used several slides to explain the chemistry of this new substance. In discussing the properties, it was indicated that many of them lie between those of glass and the usual-type plastics. Some of the outstanding properties are (1) little change in viscosity over a wide temperature range, (2) resistance to temperatures of 300°F., (3) low dielectric constant and power factor over a wide frequency range, and (4) insolubility in water. Silicoplastics are valuable as a high-temperature lubricant, chemically resistant lubricant, high-temperature insulator for use in motors, etc., and as a coating material for ceramic insulators and glass cloth. A number of silicone samples were shown, illustrating the difference in viscosity and the color of the material.

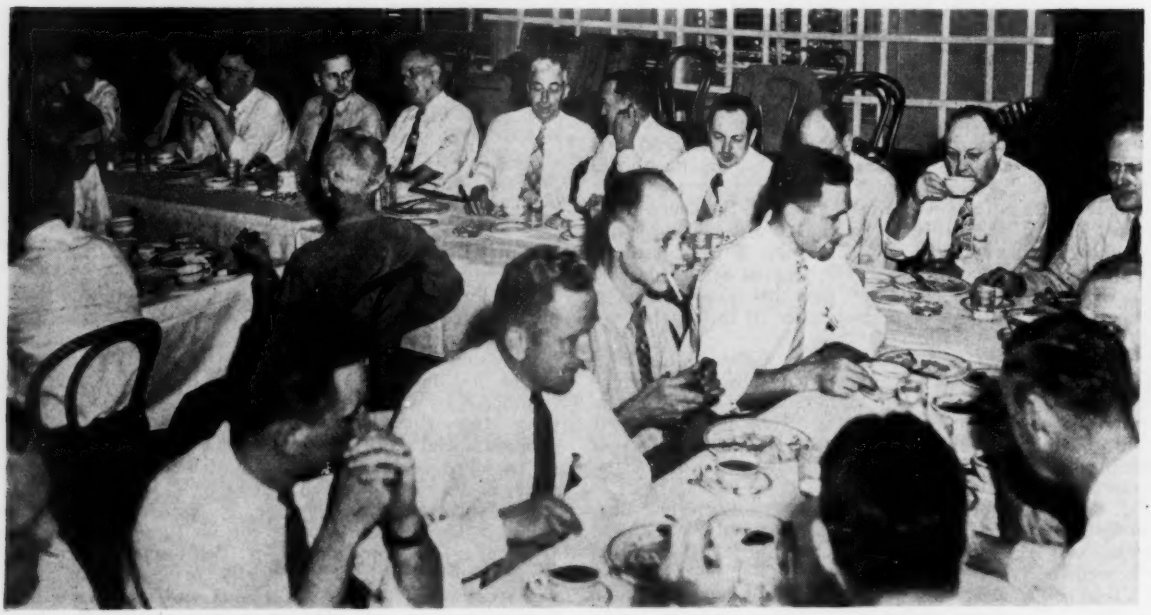
Concluding the morning session was an address by Robert C. Clothier, President of Rutgers University, on "Implications of the Recent Educational Legislation" (which made Rutgers the State University of New Jersey). Dr. Clothier stated in general that the relationship between the University and the State will be strengthened as a result of this legislation. There is nothing in the program to change the high standards of the University or any of the other traditional policies. It was pointed out that as a State University, Rutgers can plan for greater service in the future and can look forward to greater strides in research. He also assured the group that the Department of Ceramics will continue to cooperate and serve the industries to a greater extent than before. The appointment of Lt. John H. Koenig, USNR, as head of the Department, was announced (see the June, 1945, *Bulletin*, p. 222).

A buffet luncheon was served to the group at the Clubhouse. Leslie Brown, chairman of the Memorial Fund Committee, announced that the goal of $5000 set for the George H. Brown Memorial Student Loan Fund at Rutgers University had been reached. Lt. Koenig also made a few brief remarks at this time.

There were no papers scheduled for the afternoon session. The time was devoted to informal get-togethers and relaxation. A number of those present played golf. In the evening, an outdoor picnic supper was enjoyed in the grove.

The committee for the meeting was V. B. Case, *Chairman*, Fred Bentley, George T. Morse, Leslie Brown, and Edward P. McNamara.

—EMMA L. NAWROT, *Assistant Secretary, Ceramic Association of New Jersey*



Head table, summer meeting luncheon, Ceramic Association of New Jersey. (*Left to right*, beginning in upper left-hand corner): George T. Morse, Carroll Lane Fenton, Thomas H. McKeown, Lt. John H. Koenig, Fred Bentley, Robert C. Clothier, Leslie Brown, Edward P. McNamara, J. A. Williams, V. B. Case, and Charles S. Pearce.

CERAMIC ENGINEERS FOR POSTWAR SERVICE IN THE CERAMIC INDUSTRY*

By Arthur S. Watts†

The ceramic schools are being flooded with calls for ceramic engineering graduates by industries planning expansion in the postwar period. None of the schools are graduating more than a few students and nearly all of these are 4-F. All former graduates are either in military service or in essential war industries. The few being released from military service are returning to their former employers and are not reducing the demand for additional men in industry. The graduates of 1940 to 1945 who entered the armed forces on graduation and the students drafted from the schools before completing their education will require from one to three years of university training to equip them for industrial service. From the ceramic school viewpoint, we are confronted with a period of two or three years after the war ends during which very few, if any, ceramic engineering graduates will be made available and the normal rate of graduation of ceramic engineers will not be restored for four or five years after the war ends.

In an effort to secure a picture of the situation which confronts ceramic industry at this time, each of the fifteen ceramic schools was asked to furnish the writer with a record of the number of graduates, the number deceased, and the number in military service as of the following periods: (*a*) before 1920, (*b*) 1920 to 1929, inclusive, (*c*) 1930 to 1939, inclusive, and (*d*) 1940 to 1945, inclusive.

The schools furnishing ceramic engineering education are as follows: New York State College of Ceramics, Alfred, N. Y.; Georgia School of Technology, Atlanta, Ga.; Iowa State College, Ames, Iowa; Massachusetts Institute of Technology, Cambridge, Mass.; Missouri School of Mines, Rolla, Mo.; North Carolina State College, Raleigh, N. C.; Ohio State University, Columbus, Ohio; Pennsylvania State College, State College, Pa.; Rutgers University, New Brunswick, N. J.; University of Illinois, Urbana, Ill.; University of Saskatchewan, Saskatoon, Saskatchewan, Canada; University of Toronto, Toronto, Ontario, Canada; University of Washington, Seattle, Wash.; Virginia Polytechnic Institute, Blacksburg, Va.; and West Virginia University, Morgantown, W. Va.

The data provided have been assembled in Table I. In some cases, it is incomplete due to lack of records of deaths or of men entering military service, but we can safely assume that the number thus removed from the available supply is not less than the figures reported.

During the depression period (1930 to 1938), many graduates left ceramic engineering and entered other industries. When business improved, a large number of these had become established and could not be persuaded to accept ceramic engineering positions. Since 1940, many ceramic engineering graduates engaged in nonessential industries have accepted positions in essential industries outside ceramics and many of these will never return to ceramic industries.

One of the large ceramic schools reports that "a fair number of graduates are not, even in peacetime, engaged in ceramic engineering." Few of the schools have complete data as to the industrial connections of all their alumni, but if we use the records available it appears that about 23% of the living graduates not in military service are at present not engaged in the ceramic industry.

The total number of ceramic engineering graduates in the United States and Canada is 2318. Of these, 70 are deceased and 575 are now in military service, thus reducing the supply in sight now to 1673. Of these, approximately 23% are permanently out of ceramics, which reduces this figure by 385, leaving 1288. The steel industry has taken about 25 ceramic graduates. The glass industry

* Received June 28, 1945.

† Chairman, Department of Ceramic Engineering, The Ohio State University, Columbus 10, Ohio.

Group view, summer meeting luncheon, Ceramic Association of New Jersey, Trenton Country Club, June 15, 1945.

TABLE I
DATA ON CERAMIC ENGINEERING GRADUATES (AS OF JULY 1, 1945)*

	Before 1920			1920–1929, Incl.			1930–1939, Incl.			1940–1945, Incl.		
	Total	Dead	In Service	Total	Dead	In Service	Total	Dead	In Service	Total	Dead	In Service
1	133	18	2	134	3	4	156	5	31	67	0	35
2	35	?	?	113	?	6	149	?	27	132	5	66
3	24	3	0	32	2	2	41	0	10	52	2	34
4	68	10	0	123	3	6	186	3	62	131	2	76
5	11	0	0	42	0	0	47	2	5	21	0	10
6				13	?	?	38	1	2	18	?	11
7				5	0	0	10	0	3	18	0	11
8				13	?	?	33	?	?	24	?	?
9				5	0	0	64	0	3	54	2	20
10				10	1	1	56	2	25	35	0	26
11				4	0	0	49	1	4	40	1	20
12				0	0	0	12	1	8	36	1	34
13				3	0	0	32	1	21	6	0	4
14				6	1	0	11	0	4	9	0	1
15							8	0	0	9	0	1
Totals	271	31	2	503	10	19	892	16	205	652	13	349

* The order of listing here has no relationship to the list of ceramic schools presented in the introduction to this article.

has employed about 115 ceramic graduates. Research organizations such as Mellon Institute, Battelle Memorial Institute, the Armour Research Foundation, the National Bureau of Standards, the U. S. Bureau of Mines, and Engineering Experiment Stations of many universities have ceramic divisions employing altogether about 50 ceramic engineers.

In 1943, there were 53 ceramic engineering teachers employed in the United States and Canada.,

If we deduct 243 thus accounted for, we have remaining 1045 ceramic engineering graduates to staff the entire industry which consists of about 4000 plants, many of which have regularly employed from three to eight ceramic engineering graduates. This means one ceramic engineer to about four plants. If the 575 now in military service can be restored to the ceramic industry, the situation will be one ceramic engineer to about three plants.

The critical situation confronting the ceramic industries is thus apparent and calls for every industry utilizing its ceramic engineering man power with maximum efficiency. In any event, we cannot expect to supply more than one third the ceramic plants with technically trained men and little relief can be hoped for within the next three or four years.

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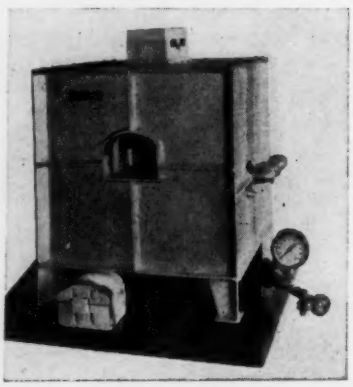

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THE MEMBERSHIP ROSTER

EACH year, the October issue of *The Bulletin* contains a complete list of the membership. It carries the addresses of members corrected to September 15.

MANY members consider it important to have their addresses constantly available to the entire ceramic industry. Many ceramists who are not members would find it desirable to be so listed.

THIS is an important service which The American Ceramic Society renders to its members. No other organization in the industry is equipped to supply this information.

DO you mention the Roster when you discuss membership with a prospect?

PAID MEMBERSHIP AND SUBSCRIPTION RECORD

Date of Record	Members Paid		Deferred	Subscriptions	Monthly Sales	Total Circulation
	Personal	Corporation				
July 21, 1944	2155	367	3	589	220	3334
January 21, 1945	2368	404	3	670	220	3665
February 21, 1945	2409	408	2	688	220	3727
March 21, 1945	2103	391	3	647	220	3364
April 21, 1945	2238	400	3	598	220	3459
May 21, 1945	2298	405	1	616	220	3540
June 21, 1945	2355	411	1	620	220	3607
July 21, 1945	2388	414	3	628	220	3653
12-month % increase	10.8	12.8		6.6		9.6

NEW MEMBERS IN JULY

Corporation

FREDERICKSBURG ART POTTERY CO., James McLane (voter), Fredericksburg, Ohio.
GENERAL ELECTRIC X-RAY CORP., J. A. Diffendaffer (voter), 2012 W. Jackson Blvd., Chicago 12, Ill.
MAHONEY, JAMES A., CO., INC., James A. Mahoney (voter), 89 James St., Newark, N. J.
NATIONAL MORTAR & SUPPLY CO., E. F. Kearins (voter), 1520 Grant Bldg., Pittsburgh, Pa.

Personal

BRAIN, DOUGLAS C., 1960 Jane St., R.D. 2, Weston, Ontario, Canada; Standard Sanitary & Dominion Radiator, Ltd.
BRINTNALL, BERT W., Box 501, Laguna Beach, Calif.
COWAN, CAROLYN A., Ohio State Univ., Engr. Experiment Sta., Columbus 10, Ohio.
ESREY, WALLACE M., R.D. 2, Box 171, Pittsburg, Calif.; Gladding, McBean & Co.
EVERETT, SAMUEL J., Messrs. S. & R. J. Everett & Co., Ltd., 939 London Rd., Thornton Heath, Surrey, England.
*EWING, ROBERT F., Fredericksburg Art Pottery Co., Fredericksburg, Ohio
GREENE, HERBERT F., General Refractories Co., Claysburg, Pa.
HANSEN, WALDEMAR C., Universal Atlas Cement Co., Gary (Buffington Sta.), Ind.; manager of Research Laboratories.
HOEMAN, ERWIN C., Battelle Memorial Inst., 505 King Ave., Columbus 1, Ohio
MCCANDLESS, EDWARD L., Linde Air Products Co., Tonawanda, N. Y.
MCLANE, JAMES, Fredericksburg Art Pottery Co., Fredericksburg, Ohio
MILLER, LAURA L., 661 La Salle Ave., Buffalo 15, N. Y.; Ceramic Laboratory Technician.
MONKS, FRANK E., 500 Dargan St., Pittsburgh, Pa.; Fuller Label & Box Co.
*PALMER, LT. GUS, JR., Quonset Point, R. I.; U. S. Navy.
PRICE, WARREN L., 162 Cedar St., Corning, N. Y.; Corning Glass Works.
*SCHMUNK, LOUIS, 70 Dunedin Dr., Toronto, Ontario, Canada; Standard Sanitary & Dominion Radiator, Ltd.
SCHREIBER, CHARLES L., 189 Cedar St., Corning, N. Y.; Corning Glass Works.

Student

University of Illinois: DONALD C. SCHELL.
Iowa State College: GEORGE VILICAN, JR.
Rutgers University: ROBERT B. BERNSTORF.

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* Indicates former member of The Society rejoining.
† Address in parentheses is former address.

MEMBERSHIP WORKERS' RECORD

CORPORATION: R. R. Shively 1, Office 3.
PERSONAL: August A. Erickson 1, R. E. Gould 1, Joseph F. Hornor 1, John Marquis 1, H. Zane Schofield 1, Felix Singer 1, W. K. Zinszer 1, Office 10.
STUDENT: Jay E. Comeforo 1, C. M. Dodd 1, Howard R. Swift 1.
GRAND TOTAL: 24.

ROSTER CHANGES IN JULY†

Personal

ALBERY, D. F., 2829 8th St., N.W., Canton 3, Ohio (Evanston, Ill.)
ALLISON, ADRIAN G., R.D. 1, Marengo, Ohio (Columbus, Ohio)
BEATTY, ROSS J., JR., 332 S. Michigan Ave., Suite 1950, Chicago 4, Ill. (Tinton, S. D.)
BURCHFIEL, COMDR. B. M., Denver, Colo. (Manhattan Beach, Calif.)
BURNHAM, FORREST E., Box 931, Alfred, N. Y. (Macon, Ga.)
CLARKE, CHARLES W., Morton, Ill. (South Milwaukee, Wis.)
CLAY, WILFRED, Roberts & Mander Stove Co., Hatboro, Pa. (Takoma Park, Md.)
FULCHER, GORDON S., 3647 Van Ness St., Washington 8, D. C. (Philadelphia, Pa.)
GOOCHEE, PVT. HERMAN, University of Minnesota, Minneapolis, Minn. (Latrobe, Pa.)
HANSEN, J. E., Ferro Enamel Corp., Box 167, Bedford, Ohio (Cleveland, Ohio)
HEDDEN, WALTER A., R.D. 1, East St., Lenox, Mass. (Dalton, Mass.)
HOSTETTER, JOHN R., 8514 Cedar St., Silver Spring, Md. (Bethesda, Md.)
MERRIAM, JACK G., 2525 East 97th Place, Chicago 17, Ill. (Toledo, Ohio)
MOHR, JOHN G., 512 Swarthmore St., Ridley Park, Pa. (Corning, N. Y.)
MORROW, C. T., 303 Tindall Rd., Lancaster Village, Wilmington 182, Del. (Cape May, N. J.)
NEWCOMB, REXFORD, JR., 276 Continental Ave., River Edge, N. J. (Bethesda, Md.)
PATTON, LT. WILLIAM R., New York, N. Y. (Alliance, Neb.)
ROMARY, JOHN F., 174 Grove St., Montclair, N. J. (Lawrence, Kans.)
ROUDABUSH, DOUGLAS E., 107 Browning Ave., Altoona, Pa. (Washington, D. C.)
STONE, ROBERT L., Stupakoff Ceramic & Mfg. Co., Latrobe, Pa. (Raleigh, N. C.)
TANCOUS, ERNEST, c/o Otto Koutesky, 7804 Drexel Ave., Chicago, Ill. (New York, N. Y.)
VAN VLACK, L. H., 405 Ash Ave., Ames, Iowa (Chicago, Ill.)
WYSONG, CHARLES F., 3004 Gainesville St., S. E., Washington 20, D. C. (Atlanta, Ga.)

MEMBERS IN SERVICE*

The following members of this Society are in fighting units of war service. There are several in service in Washington not included in this Service Roster. This list, which was begun September, 1942, and added to each succeeding month, is probably not complete, and we would appreciate information on other members.

(450) ROBERT B. BERNSTORF, Rutgers University, New Brunswick, N. J.
(451) HERMAN GOOCHEE, Stupakoff Ceramic & Mfg. Co., Latrobe, Pa.
(452) GUS PALMER, JR., U. S. Navy, Quonset Point, R. I.
(453) LAWRENCE H. VAN VLACK, Carnegie-Illinois Steel Corp., Chicago, Ill.
(454) GEORGE VILICAN, JR., Iowa State College, Ames, Iowa.

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* These are in addition to the lists published monthly, beginning with the September, 1942, *Bulletin*, with the exception of the June, 1943, issue.

★ LETTERS FROM SERVICEMEN ★

San Francisco, Calif.,
13 May, 1945

Dear Dr. Purdy:

Your news letter of 6 April has been forwarded to me here in New Guinea. I derived a lot of pleasure from reading all the letters from different servicemen. Thanks again for continuing to remember me.

I have been overseas now for about three months and have covered quite a bit of ground within that time. The places I have seen include the Philippines and the Palaus, as well as quite a lot of New Guinea. I expect to leave very shortly for Australia, so my stay out here should be very interesting as well as educational. Maybe I will have enough time to look into the ceramic industry a little while there.

The news of Germany's defeat was received very quietly over here. Our main interest here is the war with Japan and our hopes for a speedy victory are much increased.

My very best wishes for continued success.

Sincerely,
ORVILLE O. KENWORTHY,
Major, U. S. Army

★

San Francisco, Calif.,
17 May, 1945

Dear Sirs:

I am now working as a staff weather officer with the B-29's in the Marianas. This is a fine place to be stationed, and there is now little evidence of the fighting that occurred here. I spent a very pleasant two and one-half months in the Fijis before coming here, but it couldn't last. There's not much work for me here.

Regards to all.

Sincerely,
R. H. DOWS,
Lieutenant, Army Air Forces

★

Edgewood Arsenal, Md.,
26 May, 1945

Dear Dr. Purdy and Staff:

I have just received the May issue of your letter "Ceramists in the Service." I wish at this time to thank you for these letters and also give you my present Army address.

For the past two months, I have been doing considerable moving about in the eastern states. During this time, I have been lucky enough to have two short furloughs which I spent in Buffalo, N. Y. I regret that I could not be in Buffalo to attend the meeting of the Upstate New York Section. While I was in Buffalo, I visited the Titanium Alloy Mfg. Co., Niagara Falls, N. Y., where I was employed for three years before entering the Army.

During my basic training at Fort Knox, Ky., I was fortunate to have access to *The Bulletin of The American Ceramic Society* in the library. I will miss the publications very much when I get out in the Pacific.

I intend to continue my membership in The Society and have the publications sent to my Buffalo address.

I am very pleased to hear that the membership of The Society has increased during the past year. This shows that there has been a growing interest in The Society despite the small enrollment in the various ceramic schools.

Thank you again for the interesting letters. I greatly appreciate receiving any news of The Society or the ceramic industry.

Yours truly,
EVERETT A. THOMAS,
Corporal, U. S. Army

Italy,
1 June, 1945

Dear Dr. Purdy:

I am enclosing a check for $15, which I hope will cover my dues for 1945. It has been so long since I have paid any that I have forgotten just how much they are. If this does not cover everything be sure to let me know, as I am very anxious to get my publications.

Most of my time is spent around Naples these days, and it is really quite an interesting place in which to be stationed. It is great to know that things are finished over here, but we now have but one thought, "When will we get home?"

Very truly yours,
HENRY H. THOMAS,
Captain, U. S. Army

★

New York, N. Y.,
10 June, 1945

Dear Ross:

Your monthly letters to ceramists in the service have been reaching me after much delay. Late as they may be, they are still interesting to those of us who have been away from ceramics so long.

I should like to send a personal "thank you" to you and your staff for your efforts to keep us in contact with the industry.

Respectfully yours,
LE ROY GREENSPAN,
Ensign, U. S. Naval Reserve

★

Annapolis, Md.,
15 June, 1945

Dear Ross:

I just wanted to let you know of my change of address and status from Seaman First Class, Williamsburg, Va., to Midshipman, U. S. Naval Academy, Annapolis, Md.

Naturally my primary consideration for the next few years will be the Navy, but I am still very much interested in ceramics. Three years at the New York State College of Ceramics could not but leave its mark on me, so I hope that you will continue to keep me posted on matters in the ceramic world and will inform me of how to continue my membership in The Society after this year is up. There is a great place for ceramics in the Navy, especially refractories, and with the training I am about to receive I hope to be able to help correlate the views of the ceramist and the Navy man.

Your servicemen's information letter is swell. Keep it coming. Please extend my regards to The Society.

Sincerely,
JOEL RABINOWITZ,
Midshipman, U. S. Navy

★

Pasco, Wash.,
13 June, 1945

Gentlemen:

Immediately after graduation from college in December, 1942, I entered the United States Naval Reserve. At that time I discontinued my membership in The American Ceramic Society which I had held while enrolled in ceramics at The Pennsylvania State College. I wish at this time to again become a member of The Society in order to regain contact with the profession which I intend to pursue after the war.

If such membership is available, I would appreciate information pertinent to my joining The American Ceramic Society.

Very truly yours,
CORNELIUS J. REAGAN,
Lieutenant (jg), U. S. Naval Reserve

San Francisco, Calif.,
9 June, 1945

Dear Ross:

Once upon a time, as all good stories begin, I was a full-paid-up member of The Society. That was way back in 1942 (remember?) when I was a student taking ceramics at Penn State. Then I joined the Navy and let my membership slip. So, I have finally decided to rejoin and ease my ever-so-guilty conscience. I am really sorry that I have been so negligent, but no longer can it be said about me.

You have been very nice about sending me the News Letter. I really appreciate receiving it.

My address has been changed. I am overseas again having a very good time, working hard, and flying like a madman.

This is one man who is really anxious to get back into ceramics. I just keep wishing that the war will end so that I can get my hands on some clay again.

I have some teacups that were made in Japan and used by the Heavenly Sons of the Sun. They are very interesting and, of course, inferior to our china in the States. I do have one cup that has some beautiful hand painting on it, but it is just like Rembrandt painting on the sidewalk, the china is so poor. Oh, well, I suppose the Japs have their ceramic problems also.

The enclosed check should be good, even though I won it in a poker game.

Sincerely,
HAROLD FREED,
Lieutenant (jg), U. S. Navy

★

New York, N. Y.,
9 June, 1945

Dear Sirs:

I want to thank you for sending the letters from ceramic men who are at present in the service. I enjoyed reading them very much and I hope I'll continue to receive them. We have been on the move so much that most of my mail is a couple of A.P.O.'s behind me.

There is not much news I can give you at present. We are now at Assam, India, and not at present engaged in any combat flying. We were in Burma all through the campaign there until most of the Jap organized resistance was destroyed. Your guess is as good as mine as to our next assignment, but we seem to feel the sooner the better and the quicker we will get this mess over with.

Thanks again for your letters.

Sincerely yours,
GEORGE E. BROWNEWELL,
Lieutenant, Army Air Forces

★

Lewvan, Saskatchewan, Canada,
20 June, 1945

Dear Sir:

I was very pleased to receive your letter of June 6 notifying me of my election to The American Ceramic Society and also your letter telling what The Society will do for members of the armed forces upon their discharge. I expect to be discharged in approximately two months' time and would appreciate it if you could give me an indication of the fields that are growing and in need of men.

Again, many thanks for your very kind consideration.

Yours truly,
J. G. BRADY,
Lieutenant, Royal Canadian Engineers

★

Pasco, Wash.,
23 June, 1945

Dear Sir:

I received your letter of June 15 and am very pleased to have the opportunity to rejoin The American Ceramic Society. Enclosed is a check for $15 covering Student Member dues for the years 1943–1944–1945.

It would be convenient if you would send all back issues of the publications to 612 N. Third St., Steelton, Pa., and send current issues to me at my present address.

Since being in the service, I have been to several sections of the United States, the South Pacific for a year and a half, and now Washington.

The experience gained has been well worth while, although the lack of contact with technical work and study is discouraging. It was with this thought in mind that I was prompted to apply for membership.

I wish to thank you for your cooperation.

Very truly yours,
CORNELIUS J. REAGAN,
Lieutenant (jg), U. S. Naval Reserve

★

Tooele, Utah,
21 June, 1945

Dear Sir:

Thank you for your letter of 6 June, 1945, addressed to Ceramists in Service.

Not having been connected with any ceramic products firm since 1935, I have not given serious consideration to the matter of employment in the ceramic field after leaving the service at the end of the present emergency.

I have, however, given some thought to the establishment of a small pottery business of my own after the war as a part-time activity in connection with teaching in high school. With this in mind, I wonder if you would be so kind as to give me the names and addresses of ceramic trade publications most likely to contain articles on pottery design, pottery bodies, and glazes. I have in mind such publications as *Ceramic Industry* and *Ceramic Age*.

Very truly yours,
JOHN B. CHRISTENSEN,
Major, CWS

★

New York, N. Y.,
16 June, 1945

Dear Ross:

I have just received your letter dated 6 June and thank you very much. I must say The Society is on the ball as far as taking care of its men regarding the industry, employment, etc. My case is a little different. I am here in China and will be for a long time; consequently I have decided to have *The Journal* and *Ceramic Abstracts and The Bulletin* sent out here. Keep sending my old subscription to my home in the U.S.A. What I am intending to do is study up out here and so would be very grateful to have the publications sent here. My primary interest is in refractories, so any material on this subject would be especially appreciated.

What arrangements can be made to have the publications sent out here speedily? I should be only too glad to pay the additional cost for postage, even if it has to come air mail. Enclosed is a money order for $5.

Respectfully yours,
ERNEST O. TANCOUS,
First Lieutenant, U. S. Army

★

San Francisco, Calif.,
30 June, 1945

Dear Dr. Ross Purdy:

It has been just a year since I've been in the States and two years since I've studied at Alfred. Through the Navy V-12 program I did spend four months at Georgia Tech and four months at the University of Illinois studying ceramics.

I have been receiving your letters now for some time. I have derived much pleasure from them and I hope they will continue.

After the war I plan to finish up at Alfred. Just now my ceramic life is at a standstill.

You are doing a fine job at home for us and we all appreciate it.

Respectfully,
R. W. YOUNG,
Ensign, U. S. Navy

PERSONAL NOTES

GEORGE N. JEPPSON HONORED

George N. Jeppson was awarded the Honorary Degree of Doctor of Engineering by the Worcester Polytechnic Institute, Worcester, Mass., June 23, 1945.

Mr. Jeppson was presented for the Degree with the following citation:

George Nathaniel Jeppson, president and a director of the Norton Company [Worcester, Mass.], and a Trustee of this Institute, which he previously attended. With characteristic thoroughness he applied himself to master the many minor as well as major phases of the abrasive and machine-tool industry. To this end he took his place beside the workers and, moving through the various departments, went on to become Secretary and Works Manager, a Director, Treasurer and Vice-President in Charge of Production, and President. His record of accomplishment attests to his great initiative and leadership.

In industry his name is identified with the growth and development of the Norton Company; in civic life it is associated with many social, financial, health, and educational institutions to whose humanitarian purpose he has given so freely of his support and conspicuous administrative ability.

A biographical sketch of Mr. Jeppson, a Fellow of The American Ceramic Society, appeared on p. 314 of the July, 1938, *Bulletin*.

George N. Jeppson

ENGLISH POTTERS VISIT UNITED STATES

A group of English potters recently toured the United States to investigate American methods and equipment. This group spent two days in Columbus, Ohio, visiting Ohio State University, Battelle Memorial Institute, the Edward Orton, Jr., Ceramic Foundation, and The American Ceramic Society.

All of the party were from Stoke-on-Trent and included the following: Arthur E. Hewitt, managing director, W. T. Copeland & Sons, Ltd., Spode Works; Marcus Francis, director, British Pottery Research Association; F. G. Yorath, architect; Robert B. Bloore, Swinnerton's, Ltd.; Thomas Simpson, managing director, Simpson's, Ltd., Elder Works; and H. Heron, research engineer, British Pottery Research Association.

After completing their tour of other research organizations and schools, the party returned to England the latter part of June.

NELSON McCOY POTTERY COMPANY

Nelson McCoy Melick has recently been elected president and treasurer of the Nelson McCoy Pottery Co., Roseville, Ohio, to succeed Nelson McCoy, who died April 19, 1945 (see the June, 1945, *Bulletin*, p. 228). Mrs. Nelson McCoy has been elected vice-president, secretary, and chairman of the Board of Directors.

Delegation of English Potters at Battelle Memorial Institute

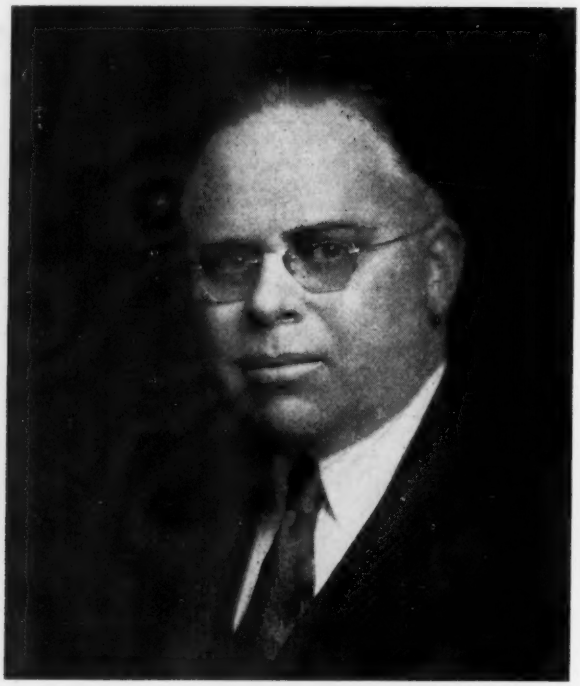
(*Left to right:*) H. Heron; John D. Sullivan, Battelle Memorial Institute; Marcus Francis; Ross C. Purdy, The American Ceramic Society; Arthur E. Hewitt; and Major Thomas Simpson.

George M. Norwood, Secretary of the Structural Clay Products Division for 1945-1946.

A short biographical sketch of Mr. Norwood appeared on p. 171 of the May, 1945, issue of *The Bulletin*.

HAROLD BOESCHENSTEIN AWARDED HONORARY DEGREE

Harold Boeschenstein, president of the Owens-Corning Fiberglas Corporation, was awarded an Honorary Degree of Doctor of Laws by Bowling Green State University, Bowling Green, Ohio, at the University's annual commencement June 22, 1945. Mr. Boeschenstein is now serving as operations vice-chairman of the War Production Board. He is shown at the extreme right in the photograph below. Others shown are (*left to right*): Carl E. Steeb, business manager of Ohio State University; The Honorable Frank J. Lausche, governor of Ohio; and President Frank J. Prout of Bowling Green State University.



W. C. McGOLPIN NAMED SECRETARY OF CANADIAN CERAMIC SOCIETY

William C. McGolpin (above) has been appointed Secretary-Treasurer of the Canadian Ceramic Society to succeed Gordon C. Keith, who died April 24, 1945 (see the May, 1945, *Bulletin*, p. 186).

Mr. McGolpin is president of the Brick & Tile Manufacturers of Canada and of the National Fireproofing Company of Canada, Ltd., Toronto, Ontario, and is Chairman of the Clay Division of the Canadian Ceramic Society.

He has been an active member of The American Ceramic Society since 1929. His biography appears on p. 380 of the November, 1943, *Bulletin*.

Miss L. C. Keith, who had worked with her father, the late Mr. Keith, for a number of years, has been appointed assistant to Mr. McGolpin to look after the detailed secretarial work. Miss Keith, former assistant editor of *Clay Products News and Ceramic Record*, official organ of the Canadian Ceramic Society, has become editor.

RESEARCH EDUCATION AT BATTELLE

John Robert Van Pelt, Jr., noted for his educational pioneering and until recently technical director of the Museum of Science and Industry, Chicago, Ill., has joined the staff of Battelle Memorial Institute, Columbus, Ohio, to head Battelle's program of research education.

The educational program, which is expected to help America maintain its top-flight position in science and to be of special interest to returning veterans who have college degrees and who can qualify for postgraduate training in the sciences, is an expansion of the plan which has been markedly successful thus far with Ohio State University, where Battelle has granted fellowships in the Graduate School since 1930.

Van Pelt Biographical Information

Born in Denver, Colo., April 2, 1896.

Education

Bachelor of Arts, Cornell College, Iowa, 1918 (completed two majors, geology and English); Bachelor of Science and Engineer of Mines, Michigan College of Mines, 1922 (member Tau Beta Pi, honorary engineering fraternity; special field, economic geology); summers of 1923–1925 spent at Iowa, Columbia, and Harvard, combining campus and field studies in geology; graduate student and teaching assistant in geology, University of Chicago, 1926–1928 (Fellow of Society of Sigma Xi); Doctor of Science (honorary) conferred in 1942 by Cornell College.

Experience Record

Teaching assistant, Mechanical Engineering, Cornell College, 1920–1922; 1922–1923, executive secretary, Cornell College (management of public relations, admissions, scholarships, etc.; served as one of three members of the Administrative Committee which operated the College for one year in the interim between two presidential administrations); 1922–1928, instructor, assistant professor, professor, Department of Geology, Cornell College (granted leave of absence in 1926 to pursue advanced study at the University of Chicago); 1926, served in summer vacation as geologist of the National Park Service; 1927, assistant geologist, and 1928–1929, associate geologist, Illinois State Geological Survey, conducting field surveys in the summers; 1928, appointed to organize the Department of Geology, Mining, and Metallurgy for the newly established Rosenwald Industrial Museum, now the Museum of Science and Industry; 1930, appointed assistant director, and in 1940 technical director in charge of exhibit planning and educational policy; 1930, sent to Europe to study leading scientific museums as background for planning the building which now houses the Museum of Science and Industry; 1929 to date, occasional engagements as consulting geologist and engineer.

Military Record and War Work

First World War, second lieutenant, Field Artillery; Second World War, served in Washington for nine months as expert consultant in the offices of the Secretary of War, as principal assistant to Brigadier General W. O. Hotchkiss, Army Specialist Corps.

Membership in Professional Organizations

Member, Society for Promotion of Engineering Education (chairman, Mineral Technology Division, 1943); member, Newcomen Society of England (secretary, Chicago Committee); member, Western Society of Engineers (member, Board of Direction, 1934 and 1939, and president, 1937); member, American Petroleum Institute; life member, American Institute of Mining and Metallurgical Engineers (chairman, Chicago Section, 1933; national director, 1940–1943; national vice-president, 1944–1947); president, Chicago Committee, Engineers' Council for Professional Development, 1938–1940.

(1945)

John Robert Van Pelt, Jr.

Publications

Author of (1) various papers and addresses on the education of engineers and scientists, the educational functions of the modern museum, and geology and economics of mineral resources and (2) feature article on coal for Encyclopedia Britannica Junior.

THE SCHEIERS IN PUERTO RICO

Edwin Scheier, nationally known ceramist and instructor in arts at the University of New Hampshire, Durham, N. H., left in June for Puerto Rico to take an active part in the ceramic program being developed there as part of a Government plan to industrialize the island. On leave of absence from the University, he was accompanied by his wife, Mary Scheier, who is also well known for her work in ceramics and puppetry.*

While on the island, the Scheiers will work with the Puerto Rico Development Company, San Juan, which was established by the Government when the island's economic problem of dense and rapidly increasing population, insufficient land, and widespread unemployment made industrialization seem to be the best solution.

Through a ceramic design laboratory, one of the many new industries using native workers and materials, Edwin and Mary Scheier will originate designs which can be reproduced on a large scale. The purpose of the program is to provide goods to lower the heavy imports now necessary.

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* See the August, 1943, *Bulletin*, pp. 263–70, for an article featuring the Scheiers and their work.

IMPORTANT GOVERNMENT MISSIONS

Many men are being sent to Europe this summer on important Government missions. Members of The American Ceramic Society are being called upon to take an active part in this work. John W. Whittemore, Virginia Polytechnic Institute, Blacksburg, Va., is already there. Stuart M. Phelps, Mellon Institute, Pittsburgh, Pa.; Gilbert E. Seil, Day & Zimmermann, Inc., Philadelphia, Pa.; and Ralston Russell, Jr., Research Labs., Westinghouse Electric Corp., Pittsburgh, Pa., have recently been appointed to participate in this work.

A. F. GREAVES-WALKER APPOINTED CHIEF, METALS AND MINERALS BRANCH, WPB

The Office of Production Research and Development of the War Production Board has announced the appointment of Arthur F. Greaves-Walker as chief of the Metals and Minerals Branch.

On leave of absence from the University of North Carolina, Dr. Greaves-Walker has been in Washington since June, 1942, where he first served as chief of the Non-Metals Section of WPB. In February, 1943, he was transferred to the Office of Production Research and Development as deputy chief of the Metals and Minerals Branch.

Dr. Greaves-Walker was also recently reappointed by the American Institute of Mining and Metallurgical Engineers for another three-year term on the Engineers' Council for Professional Development. He is very active in the affairs of the Institute of Ceramic Engineers and is always on the alert for ways and means of improving the status of ceramic engineers and the engineering profession.

MIDWEST RESEARCH INSTITUTE

George E. Ziegler, physicist on the staff of the Midwest Research Institute, Kansas City, Mo., has been appointed executive scientist in charge of all project production.

Dr. Ziegler, formerly chairman of the Physics Section of the Armour Research Foundation, Chicago, Ill., directed the development of the wire sound recorder.

Others appointed to head various departments of the Institute include George W. Ward, geologist and mineralogist, chairman of inorganic chemistry (for biography and photo, see the January, 1945, *Bulletin*, pp. 39–40); C. L. Shrewsbury, chairman of agricultural research; Frank H. Trimble, physicist, chairman of applied physics research; and Carl M. Marberg, chairman of organic chemistry.

RICHARD MOLL AT UNIVERSITY OF NEW HAMPSHIRE

Richard Moll, instructor in ceramics, became a member of the Arts Department of the University of New Hampshire, Durham, N. H., in June and taught two courses during the summer session (July 2 to August 10).

Mr. Moll studied at the School of Art, Washington University, at the Vesper George School of Art, and at the Art Students League and has traveled and studied in Europe. He was an assistant instructor at the Art Students League and at the Brooklyn Institute of Arts and Sciences and has taught at the Manchester Institute of Arts and Sciences. For several years, he has maintained his own pottery in Somersworth, N. H., and has produced for the League of New Hampshire Arts and Crafts.

VETERAN LAW MANUAL

Commerce Clearing House, Inc., 214 N. Michigan Ave., Chicago 1, Ill., has published a complete manual of the laws and regulations covering the rights of returning servicemen. The cost is $2.

R. L. COOK TO EUROPE

Ralph L. Cook, member of the staff of the Department of Ceramic Engineering at the University of Illinois, is on his way to Germany. He is to work on a project sponsored by the Army Air Forces, Air Technical Service. He left for Washington early in July and is scheduled to return late in September.

CERAMIC EDUCATIONAL COUNCIL

At a meeting of the Ceramic Educational Council in Pittsburgh, Pa., April 2, 1944, the Committee on Rules submitted proposed changes in the Rules for nomination of officers. Charles M. Dodd, president during 1944–1945, has announced that this amendment has been adopted by a unanimous vote of the Council.

This amendment was published in the July, 1944, *Bulletin*, p. 232.

★ NECROLOGY ★

LT. MALCOLM A. SCHWEIKER, JR.

Lt. Malcolm A. Schweiker, Jr., a graduate of the Department of Ceramics, Rutgers University, New Brunswick, N. J., class of 1943, was killed in action on Okinawa April 12. He was the son of Malcolm A. Schweiker, president of the American Encaustic Tiling Company and vice-president of the Franklin Tile Company, Lansdale, Pa.

Lt. Schweiker joined the armed forces following his graduation. He received his commission from OCS at Fort Benning, Ga., in October, 1943, where he remained as instructor until November, 1944. He was then promoted to first lieutenant and ordered to active duty in the Pacific, serving in the infantry. He landed on Okinawa April 1.

While at college, Lt. Schweiker was an outstanding student. His friendliness and ability, together with his high ideals and aspirations, made him one of the leaders on campus. He held many important offices and honors, including election to Phi Beta Kappa. He was a member of Delta Upsilon fraternity.

Lt. Schweiker had been a member of The American Ceramic Society since 1943.

MAJOR RONALD MACDONALD

Major Ronald Macdonald, formerly works manager of the Nigel Branch of the Primrose Brick Works (1936), Ltd., Germiston, Transvaal, South Africa, was killed in Tunisia April 8, 1943.

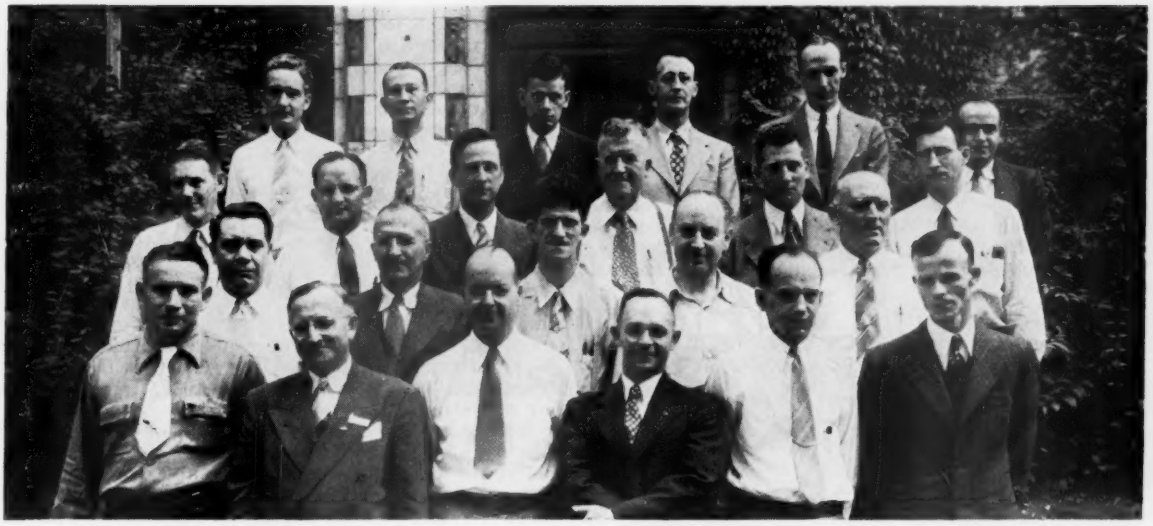
L. E. Garlick, a managing director of the Primrose Brick Works, recently sent us a brief biographical sketch of Major Macdonald, as follows:

"Major Macdonald was born in Hong Kong in 1909. He was educated in South Africa, England, and Switzerland, following which he worked for some years with the London Brick & Forders, England, before returning to his home in South Africa, where he finally joined the Primrose Brick Works as works manager of their Nigel Branch. On the commencement of hostilities, he, with several other members of our staff, volunteered for active service, and, as indicated by his rank, he quickly gained promotion.

"He was of a particularly bright and cheerful disposition and, besides being a brick and clay enthusiast, took a keen interest in sponsering sport amongst the staff.

"He is survived by his wife and his mother."

Major Macdonald had been a member of The American Ceramic Society since 1937.



Technical Group Meeting of Enameled Utensil Manufacturers' Council

Left to right, first row: Ray Hultz, J. C. Vollrath, H. Boyer, Lonnie Ashby, Leas Housley, F. Buckaleu. Second row: Jack Zimmerman, E. C. Dexheimer, Al Mallonn, Paul Huppert, Sam Chambers. Third row: F. A. Petersen, F. J. Hodnick, G. A. Foehse, Paul Mallonn, Mr. Peters, Jim Theodore. Fourth row: Earl Kelsey, Ed Mulvane, Martin Fisher, B. S. Kirk, E. A. Schwarz, C. M. Andrews.

ENAMELED UTENSIL MANUFACTURERS' COUNCIL

The third general meeting of the technical representatives of the companies belonging to the Enameled Utensil Manufacturers' Council was held at the Department of Ceramic Engineering, University of Illinois, June 28 and 29, 1945.

Twenty-two men were present at the meeting which dealt with control in the enamel shop. A summary of some work done to determine the effect of coefficient of expansion on the properties of enameled ware was also presented.

The guest speaker at the banquet on Thursday evening was R. F. Bisbee of Westinghouse. This paper was very well received, since it pointed out how control can be used effectively in the enameling plant to produce better products more efficiently. J. B. Simons also attended and spoke to the men.

The complete program for the meeting was as follows:

Thursday, June 28, 1945

(1) Group Luncheon, Urbana-Lincoln Hotel, Urbana, Ill.
(2) Welcome to Illinois, DEAN M. L. ENGER.
(3) "Effect of Expansion on Thermal Shock and Impact Resistance," F. A. PETERSEN.
(4) "Control in Frit Production," A. I. ANDREWS.
(5) Banquet, Urbana-Lincoln Hotel.
(6) "Process and Quality Control in the Enamel Shop," R. F. BISBEE, Westinghouse Electric Corporation.

Friday, June 29, 1945

(7) "Pickleroom Control," C. M. ANDREWS.
(8) "Control of Enamels," F. A. PETERSEN.
(9) Group Luncheon, Urbana-Lincoln Hotel.
(10) "Control of Enameling," F. A. PETERSEN.
(11) "The Value of Control," D. G. BENNETT.

After five years of faithful work, the old Technical Committee was given a well-deserved vote of thanks and a new group was appointed. The old Technical Committee consisted of E. C. DEXHEIMER, *Chairman;* H. C. ARNOLD, B. S. KIRK, E. H. KELSEY, P. A. MALLONN, and A. J. VOLLRATH.

The new Committee is as follows: E. H. KELSEY, *Chairman;* O. E. MULVANE, J. C. VOLLRATH, LONNIE ASHBY, PAUL HUPPERT, JACK ZIMMERMAN.

The complete registration for the meeting was as follows: Belmont Stamping Co., B. S. KIRK; Canton Stamping and Enameling Co., F. J. HODNICK; Columbian Enameling and Stamping Co., RAY HULTZ, E. H. KELSEY; Crunden Martin Manufacturing Co., E. A. SCHWARZ; Fletcher Enamel Co., F. BUCKALEU, H. M. ZIMMERMAN; Jones Metal Products Co., H. BOYER, JIM THEODORE; Lisk-Savory Corp., PAUL HUPPERT; Moore Enameling and Manufacturing Co., O. E. MULVANE; National Enameling and Stamping Co., MARTIN FISHER, E. C. DEXHEIMER, GEORGE FOEHSE; Polar Ware Co., A. J. VOLLRATH; Republic Stamping and Enameling Co., LEAS HOUSLEY, AL MALLONN, PAUL MALLONN; U. S. Stamping Co., LONNIE ASHBY, S. A. CHAMBERS, MR. PETERS; Vollrath Co., J. C. VOLLRATH; Westinghouse Electric Corporation, R. F. BISBEE, J. B. SIMONS; University of Illinois, College of Engineering: DEAN M. L. ENGER, A. I. ANDREWS, C. M. ANDREWS, D. G. BENNETT, and F. A. PETERSEN.

STRUCTURAL DIMENSIONAL COORDINATION

The outlook for the widespread use of dimensional coordination in postwar construction has been further improved by the adoption of new modular sizes of glazed and unglazed facing tile.

Manufacturers of brick and structural clay tile previously have announced their modular sizes, having been the first group of building manufacturers to adopt coordinated dimensions.

The new sizes of facing tile will measure $3^3/_4$ by 5 by $11^3/_4$ inches and $3^3/_4$ by $3^3/_4$ by $11^3/_4$ inches, which will give nominal sizes of 4 by $5^1/_3$ by 12 inches and 4 by 4 by 12 inches when mortar joints are considered.

As a result of wartime experience, the use of facing tile is expected to increase sharply as soon as civilian construction gets well under way. The product is especially suitable for factories and public buildings because of low maintenance costs and ease of cleansing which permits greater sanitation.

In addition, walls can be constructed and finished in one operation. Facing tile combines load-bearing qualities with a colorful, non-fading surface which requires no maintenance expense other than occasional washing. It is suitable for both interior and exterior surfaces.

THE ENAMEL BIBLIOGRAPHY

In the recently published Enamel Bibliography the information on the title page is misleading. The list was not compiled by E. H. McClelland. Morris Schrero was in responsible charge of the entire work. The following title and prefatory note, submitted with the compilation early in 1941, are self-explanatory except for the alternative wording of the suggested title. This title was submitted with the understanding that The Society or the Enamel Division would decide whether the list should be called "porcelain" or "vitreous" enameling. (The title "Enamel Bibliography" might include coatings painted on wood.)

BIBLIOGRAPHY AND ABSTRACTS OF VITREOUS (PORCELAIN) ENAMELING ON METALS, 1928–1939

Compiled by the Technology Department of the Carnegie Library of Pittsburgh under the Direction of Morris Schrero for the Enamel Division of The American Ceramic Society

This Bibliography, devoted to vitreous enameling on metals, supplements the Bibliography and Abstracts of Literature on Enamels by Robert D. Landrum and H. D. Carter, published as Part II of *The Journal of The American Ceramic Society*, Volume 12, May, 1929.

The present Bibliography covers the period 1928 through 1939 and contains almost 5000 items, some of which have several references. It includes (1) virtually all of the references and abstracts published (during 1928–1939) in the Enamel Section of *Ceramic Abstracts;* (2) many published in other Sections, but of interest to enamelers; and (3) a number of references from other sources apparently not covered by *Ceramic Abstracts*, but added by the present compiler. In accordance with good bibliographic practice, these additional references were examined in the original in every case in which the original was available in the Carnegie Library of Pittsburgh.

In a few cases, references (to the same paper) in *Ceramic Abstracts* have been combined, and the citation following the item here refers to the page of *Ceramic Abstracts* on which the abstract was published. Square brackets are used to inclose any material added by the compiler to abstracts taken from publications of The American Ceramic Society.

Arrangement is in a single alphabet by names of authors, with anonymous articles filed by title.

The work of compilation was greatly facilitated by the courtesy of Ross C. Purdy, who furnished two copies of the available publications of The American Ceramic Society for 1928–1939.

In outlining the scope of the list and establishing the boundaries of the field to be covered, valuable advice was given by J. E. Rosenberg, Chairman of the Bibliography Committee of the Enamel Division of The American Ceramic Society.

Various members of the Technology Department staff gave some help with the list, but the work was entirely in the hands of Morris Schrero, who planned the compilation, supervised the strictly routine operations, and did much of the work.

Considerable routine work, such as clipping and pasting, was done (under supervision) by clerical help provided by the United States Works Progress Administration and the United States Work Projects Administration.

Some of the abstracts deal with very specific subjects, others are quite general in scope and concerned with a number of subjects. For this reason, classification of the abstracts was not feasible. The present arrangement permits a complete approach by names of authors, and the office of *Ceramic Abstracts* is to provide an index by subjects.

E. H. McCLELLAND,
Technology Librarian,
Carnegie Library of Pittsburgh

Though not so indicated in the published work, the index was made in the office of *Ceramic Abstracts.*

The work of compilation was undertaken by the Technology Department of the Carnegie Library of Pittsburgh, at the request of the Bibliography Committee of the Enamel Division, and Mr. Schrero's connection therewith was well known, his competent work having been recognized by an honorarium from The American Ceramic Society in 1941 (*Bull. Amer. Ceram. Soc.*, **20** [8] 291 (1941)) at the suggestion of the Bibliography Committee.

The Bibliography as published does not reveal the reason for beginning with 1928 and does not indicate the sources of the material. Most of the abstracts are from *Ceramic Abstracts*, and every abstract therefrom was identified by the page and volume where it originally appeared. (For some reason, all these references were omitted in publishing.) More than three hundred references from sources other than *Ceramic Abstracts*, 1928–1939, were added during compilation.

No one in the Technology Department of the Carnegie Library of Pittsburgh received proofs or was consulted about the title page or the make-up. Inclusion of information such as given in the foregoing prefatory statement would have been useful, and the more specific title suggested would seem to be preferable.

J. E. ROSENBERG, *Chairman, Bibliography Committee of the Enamel Division*

E. H. McCLELLAND, *Technology Librarian, Carnegie Library of Pittsburgh*

FELLOW AMENDMENT BALLOTING

Ballots on the proposed amendments to the Constitution of The American Ceramic Society (the change in Article III and the deletion of Article IX)* show: "Yes," 577; "No," 4; ballots improperly marked, 2; not voting, 5; total ballots, 588.

Article XV of the Constitution states that a two-thirds favorable vote of those cast is required for approval. Upon determination of said majority the amendments are immediately effective. The amendments are, therefore, in force. This does away with the autonomous existence of the Fellows and the Fellows' Rules. The Fellows are now to be known and listed as Fellows, an honor group, and Fellows' affairs will be controlled by the Board of Trustees.

* See *Bull. Amer. Ceram Soc.*, **23** [10] 389 (1944) and **24** [5] 182 (1945); also p. 299, this issue.

INDIAN CERAMIC SOCIETY SCHOLARSHIP

A scholarship for the advanced study of ceramics in the United States by an Indian student has been established by M. M. Sur, of the Sur Enameling & Stamping Works, Calcutta, India. This scholarship, which carries a stipend of Rs. 10,000, has been awarded to M. L. Misra of the Department of Ceramics of the Benares Hindu University, Benares, India.

Mr. Sur established the scholarship to promote a comparative study of Indian clays with foreign clays to bring about an improvement in the Indian ceramic industry. It was awarded through the Indian Ceramic Society, of which Mr. Sur has been president for three years.

Mr. Misra, who is a research scholar at Benares University and who has already done research work on clays in India as well as teach ceramics, will enter an American university in the fall for extended study of the problem.

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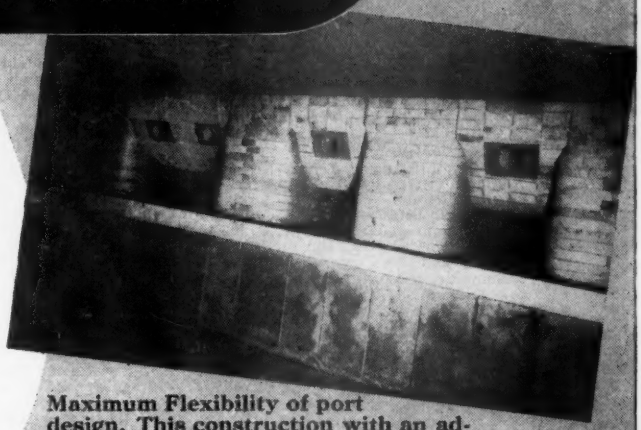

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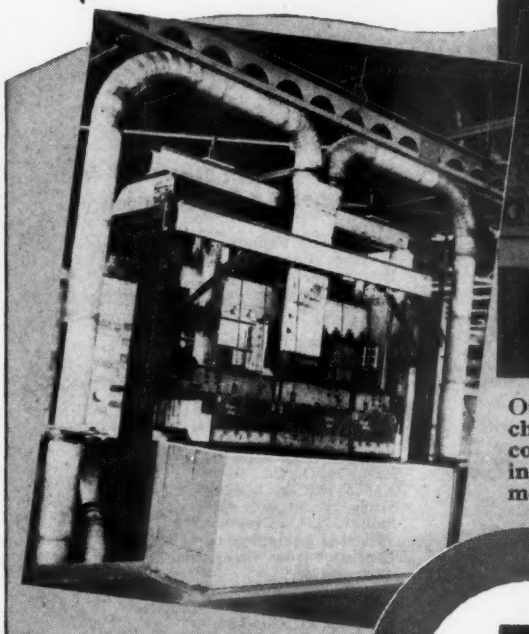

Inside view of tank showing adjustable suspended back wall and "fritting" chamber. The incoming materials stream is uniformly distributed across the "fritting" chamber for faster and more complete dust free melting.

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Acid-proof Mortars
Corhart Refractories Co.

Air Conditioning Systems
Frazier-Simplex, Inc.

Aloxite (Refractory Products)
Carborundum Co.

Alumina (Hydrate and Calcined)
Drakenfeld, B. F., & Co., Inc.
Du Pont de Nemours E. I., & Co., Inc.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Pennsylvania Salt Mfg. Co.
Vitro Mfg. Co.

Alumina (Fused) Brick and Tile
Electro Refractories & Alloys Corp.
Remmey, Richard C., Son Co.
Vitro Mfg. Co.

Aluminum Oxide (Calcine)
Hommel, O., Co., Inc.
Vitro Mfg. Co.

Aluminum Oxide (Fused)
Carborundum Co.
Electro Refractories & Alloys Corp.
Foote Mineral Co.
Norton Co.
Vitro Mfg. Co.

Alundum (Refractory Products)
Norton Co.

Ammonium Bicarbonate
Du Pont de Nemours, E. I., & Co., Inc.
Hommel, O., Co., Inc.
Solvay Sales Corp.

Ammonium Bifluoride
Drakenfeld, B. F., & Co., Inc.
Du Pont de Nemours, E. I., & Co., Inc.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Innis, Speiden & Co.
Vitro Mfg. Co.

Ammonium Carbonate
Drakenfeld, B. F., & Co., Inc.
Du Pont de Nemours, E. I., & Co., Inc.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Vitro Mfg. Co.

Antimony Oxide
Drakenfeld, B. F., & Co., Inc.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Metal & Thermit Corp.
Vitro Mfg. Co.

Antimony Sulphide
Foote Mineral Co.
Harshaw Chemical Co.
Hommel, O., Co., Inc.

Arches(Interlocking, Suspended, and Circular)
Frazier-Simplex, Inc.

Arsenic
Drakenfeld, B. F., & Co., Inc.
Harshaw Chemical Co.
Hommel, O., Co., Inc.

Automatic Brick Car Loaders
Lancaster Iron Works, Inc.

Ball Mills
Drakenfeld, B. F., & Co., Inc.
Hommel, O., Co., Inc.
McDanel Refractory Porcelain Co.
Vitro Mfg. Co.

Ball Mills (Laboratory Type)
Drakenfeld, B. F., & Co., Inc.
Hommel, O., Co., Inc.
Vitro Mfg. Co.

Barium Carbonate
Drakenfeld, B. F., & Co., Inc.
Du Pont de Nemours, E. I., & Co., Inc.
Foote Mineral Co.
Hammill & Gillespie, Inc.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Vitro Mfg. Co.

Barytes
Clinchfield Sand & Feldspar Corp.
Harshaw Chemical Co.

Basic Oxides
Drakenfeld, B. F., & Co., Inc.
Ferro Enamel Corp.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Pemco Corp.

Batch Systems & Chargers
Frazier-Simplex, Inc.

Batts
Carborundum Co. ("*Carbofrax Aloxite*")
Electro Refractories & Alloys Corp.
Norton Co. (*Alundum-Crystolon*)
Remmey, Richard C., Son Co.

Bentonite
Great Lakes Foundry Sand Co.
Hammill & Gillespie, Inc.
Harshaw Chemical Co.
Hommel, O., Co., Inc.

Beryl
Foote Mineral Co.

Bichromate of Soda
Harshaw Chemical Co.
Hommel, O., Co., Inc.

Bitstone
Potters Supply Co.

Blocks (Refractory)
Carborundum Co.
Corhart Refractories Co.
Electro Refractories & Alloys Corp.
Norton Co.
Remmey, Richard C., Son Co.
Vitro Mfg. Co.

Blowers
Robinson Ventilating Co.

Body Stains
Drakenfeld, B. F., & Co., Inc.
Du Pont de Nemours, E. I., & Co., Inc.
Ferro Enamel Corp.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Maxson, Elwyn L.
Pemco Corp.

Bone Ash
Drakenfeld, B. F., & Co., Inc.
Harshaw Chemical Co.
Hommel, O., Co., Inc.

Borax
American Potash & Chemical Corp.
Drakenfeld, B. F., & Co., Inc.
Du Pont de Nemours, E. I., & Co., Inc.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Innis, Speiden & Co.
Pacific Coast Borax Co.
Pemco Corp.
Stauffer Chemical Co.
Vitro Mfg. Co.

Borax Glass
Drakenfeld, B. F., & Co., Inc.
Du Pont de Nemours, E. I., & Co., Inc.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Pacific Coast Borax Co.
Stauffer Chemical Co.
Vitro Mfg. Co.

Boric Acid (Anhydrous)
Drakenfeld, B. F., & Co., Inc.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Pacific Coast Borax Co.
Stauffer Chemical Co.
Vitro Mfg. Co.

Boric Acid (Crystal, Granular, or Powder)
American Potash & Chemical Corp.
Drakenfeld, B. F., & Co., Inc.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Innis, Speiden & Co.
Pacific Coast Borax Co.
Stauffer Chemical Co.
Vitro Mfg. Co.

Boron Carbide
Norton Co.

Brick Machines (also Barrows, Molds)
Lancaster Iron Works, Inc.

Brick (Refractory)
Carborundum Co. ("*Carbofrax Aloxite*")
Corhart Refractories Co.
Electro Refractories & Alloys Corp.
Norton Co.
Remmey, Richard C., Son Co.
Vitro Mfg. Co.

Cadmium Oxide
Drakenfeld, B. F., & Co., Inc.

Cadmium Sulphide
Drakenfeld, B. F., & Co., Inc.
Du Pont, de Nemours and Co., Inc., Electrochemicals Dept.
Ferro Enamel Corp.
Harshaw Chemical Co.
Hommel, O., Co., Inc.

Carbofrax (Refractory Products)
Carborundum Co.

Carbonates (Barium, Lead)
Drakenfeld, B. F., & Co., Inc.
Du Pont de Nemours, E. I., & Co., Inc.
Foote Mineral Co.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Vitro Mfg. Co.

Castings
Lancaster Iron Works, Inc.

Caustic Potash
Du Pont de Nemours, E. I., & Co., Inc.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Solvay Sales Corp.

Caustic Soda
Du Pont de Nemours, E. I., & Co., Inc.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Pennsylvania Salt Mfg. Co.
Solvay Sales Corp.
Stauffer Chemical Co.
Vitro Mfg. Co.

Cements
Bausch & Lomb Optical Co.
Carborundum Co.
Corhart Refractories Co.
Electro Refractories & Alloys Co.
Norton Co.
Pennsylvania Salt Mfg. Co.
Remmey, Richard C., Son Co.

Ceramic Chemicals
Drakenfeld, B. F., & Co., Inc.
Du Pont de Nemours, E. I., & Co., Inc., Electrochemicals Dept.
Ferro Enamel Corp.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Metal & Thermit Corp.
Pemco Corp.
Pennsylvania Salt Mfg. Co.
Titanium Alloy & Mfg. Co.
Vitro Mfg. Co.

Cerium Oxide
Drakenfeld, B. F., & Co., Inc.
Foote Mineral Co.
Harshaw Chemical Co.
Hommel, O., Co., Inc.

Chromite (Natural Chromate of Iron)
Foote Mineral Co.
Hommel, O., Co., Inc.

Chromium Oxide
Drakenfeld, B. F., & Co., Inc.
Du Pont de Nemours, E. I., & Co., Inc., Electrochemicals Dept.
Ferro Enamel Corp.
Hommel, O., Co., Inc.
Pemco Corp.
Vitro Mfg. Co.

Clay (Ball)
Hammill & Gillespie, Inc.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Kentucky Clay Mining Co.
Maxson, Elwyn L.
Potters Supply Co.
Spinks, H. C., Clay Co.
Vitro Mfg. Co.

Clay (China)
Hammill & Gillespie, Inc.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Maxson, Elwyn L.
Vitro Mfg. Co.

Clay—Cleaners, Feeders
Lancaster Iron Works, Inc.

Clay (Electrical Porcelain)
Hammill & Gillespie, Inc.
Hommel, O., Co., Inc.
Kentucky Clay Mining Co.
Maxson, Elwyn L.
Spinks, H. C., Clay Co.

Clay (Enamel)
Ferro Enamel Corp.
Hammill & Gillespie, Inc.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Kentucky Clay Mining Corp.
Maxson, Elwyn L.
Metal & Thermit Corp.
Pemco Corp.
Spinks, H. C., Clay Co.
Titanium Alloy & Mfg. Co.
Vitro Mfg. Co.

Clay (Fire)
Great Lakes Foundry Sand Co.
Maxson, Elwyn L.
Potters Supply Co.

Clay (Micronized)
Pemco Corp.

Clay Miners
Great Lakes Foundry Sand Co.
Kentucky Clay Mining Co.
Maxson, Elwyn L.
Spinks, H. C., Clay Co.

Clay (Modeling)
Potters Supply Co.

Clay (Potters)
Hammill & Gillespie, Inc.
Hommel, O., Co., Inc.
Kentucky Clay Mining Co.
Maxson, Elwyn L.
Spinks, H. C., Clay Co.

Clay (Process Equipment)
Lancaster Iron Works, Inc.

Clay (Sagger)
Georgia Kaolin Co.
Great Lakes Foundry Sand Co.
Hommel, O., Co., Inc.
Kentucky Clay Mining Co.
Maxson, Elwyn L.
Spinks, H. C., Clay Co.

Clay-Slip (Albany)
Hammill & Gillespie, Inc.
Hommel O., Co., Inc.
Maxson, Elwyn L.

Clay (Wad)
Kentucky Clay Mining Co.
Spinks, H. C., Clay Co.

Clay (Wall Tile)
Hammill & Gillespie, Inc.

DISTINCTION AND DURABILITY

IN YOUR GLASSWARE DECORATIONS

Beauty... of warm rich color—in applications ranging from simple bands or stripes to intricate design and lettering, will be an increasingly important factor in glassware marketing. Permanency of tone, sharpness of line, and resistance to defacements ... all will have their important sales value.

A wider range of shades, more stability towards fading, and faster, more accurate methods of applying will be available as aids in turning out better decorated work. Du Pont colors will be even better ... alkali-resistant tints that speak to the eye, yet endure many washings undimmed and unmarred. For table ware and other food-serving pieces, there will be Du Pont acid- and sulfide-resistant colors—safe to use inside or out, hot or cold, as foods will not affect them. A new Squeegee Oil from Du Pont will be important in screen color work for multi-color design or legend decoration.

And new information too! Demonstration and testing in your own plant by our technical staff will provide recommendations for materials and processes that you *know* will work. To learn of what Du Pont has to offer in glass and ceramic colors, write E. I. Du Pont de Nemours & Co. (Inc.), Electrochemicals Department, Wilmington 98, Delaware.

DU PONT

COLORS and DECORATIONS

for CERAMICS and GLASS

DU PONT

BETTER THINGS FOR BETTER LIVING ... THROUGH CHEMISTRY

Kentucky Clay Mining Co.
Maxson, Elwyn L.
Spinks, H. C., Clay Co.

Cleaners
Harshaw Chemical Co.
Pemco Corp.
Pennsylvania Salt Mfg. Co.
Solvay Sales Corp.

Clocks (Gauge Board)
Hommel, O., Co., Inc.

CO_2 Recorders
Leeds & Northrup Co.

Cobalt, Oxide
Drakenfeld, B. F., & Co., Inc.
Du Pont de Nemours, E. I., & Co., Inc., Electrochemicals Dept.
Ferro Enamel Corp.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Pemco Corp.
Vitro Mfg. Co.

Cobalt Sulphate
Drakenfeld, B. F., & Co., Inc.
Du Pont, de Nemours, E. I., & Co., Inc., Electrochemicals Dept.
Ferro Enamel Corp.
Harshaw Chemical Co.
Hommel, O., Co., Inc.

Colors
Drakenfeld, B. F., & Co., Inc.
Du Pont de Nemours, E. I., & Co., Inc., Electrochemicals Dept.
Ferro Enamel Corp.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Maxson, Elwyn L.
Pemco Corp.
Vitro Mfg. Co.

Combustion Control
Leeds & Northrup Co.

Combustion Meters (CO_2 Recorders)
Leeds & Northrup Co.

Cone Plaques
Industrial Ceramic Products, Inc.

Cones
Edward Orton, Jr., Ceramic Foundation
Maxson, Elwyn L.

Controllers—Automatic Tank Pressure
Leeds & Northrup Co.

Conveying Equipment
Frazier-Simplex, Inc.
Lancaster Iron Works, Inc.

Copper Oxide
Drakenfeld, B. F., & Co., Inc.
Harshaw Chemical Co.
Hommel, O., Co., Inc.

Cornwall Stone (Imported)
Drakenfeld, B. F., & Co., Inc.
Hammill & Gillespie, Inc.
Hommel, O., Co., Inc.
Maxson, Elwyn L.

Corundum Refractories
Corhart Refractories Co.

Crucibles (Filter, Melting, Ignition)
Norton Co.

Crushers (Clay)
Lancaster Iron Works, Inc.

Cryolite (see Kryolith)
Drakenfeld, B. F., & Co., Inc.
Du Pont de Nemours, E. I., & Co., Inc.
Harshaw Chemical Co.
Pennsylvania Salt Mfg. Co.
Vitro Mfg. Co.

Crystolon (Refractory Products)
Norton Co.

Cullet, Washing Plants, Incinerators, Crushers
Frazier-Simplex, Inc.

Cutters (Bar)
Industrial Ceramic Products, Inc.

Decalcomania
Commercial Decal, Inc.

Decorating Supplies
Commercial Decal, Inc.
Drakenfeld, B. F., & Co., Inc.
Du Pont de Nemours, E. I., & Co., Inc., Electro chemicals Dept.
Ferro Enamel Corp.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Vitro Mfg. Co.

Disintegrators
Lancaster Iron Works, Inc.

Dryer (Pipe Rack)
Lancaster Iron Works, Inc.

Dryers (Waste Heat, Continuous and Batch Type)
Harrop Ceramic Service Co.

Drying Machinery
Frazier-Simplex, Inc.
Lancaster Works, Inc.

Electrocast Refractories
Corhart Refractories Co.

Enameling Equipment (Complete)
Ferro Enamel Corp.
Hommel, O., Co., Inc.
Vitro Mfg. Co.

Enameling Furnaces
Carborundum Co.
Ferro Enamel Corp.
Hommel, O., Co., Inc.
Norton Co.

Enameling Iron (Sheet)
American Rolling Mill Co.

Enameling Muffles
Carborundum Co. (*Carbofrax*)
Maxson, Elwyn L.
Norton Co. (*Alundum*)

Enameling (Practical Service)
Ferro Enamel Corp.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Metal & Thermit Corp.
Pemco Corp.
Titanium Alloy & Mfg. Co.
Vitro Mfg. Co.

Enamels
Drakenfeld, B. F., & Co., Inc.
Du Pont de Nemours, E. I., & Co., Inc., Electrochemicals Dept.
Ferro Enamel Corp.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Maxson, Elwyn L.
Pemco Corp.
Vitro Mfg. Co.

Enamel Oxide
Drakenfeld, B. F., & Co., Inc.
Du Pont de Nemours, E. I., & Co., Inc., Electrochemicals Dept.
Ferro Enamel Corp.
Harshaw Chemical Co.
Hommel, O., Co., Inc.

Enamels (Porcelain)
Ferro Enamel Corp.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Pemco Corp.
Titanium Alloy & Mfg. Co.
Vitro Mfg. Co.

Engineering Service
Ferro Enamel Corp.
Frazier-Simplex, Inc.
Harrop Ceramic Service Co.

Epsom Salts
Innis, Speiden & Co.

Equipment (Porcelain Enameling)
Ferro Enamel Corp.
Hommel, O., Co., Inc.

Fans
Robinson Ventilating Co.

Feldspar
Clinchfield Sand & Feldspar Corp.
Du Pont de Nemours, E. I., & Co., Inc., Electrochemicals Dept.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Maxson, Elwyn L.
Pemco Corp.
Solvay Sales Corp.
Vitro Mfg. Co.

Filter Fabrics
Metakloth Company

Fire Brick
Carborundum Co.
Corhart Refractories Co.
Electro Refractories & Alloys Corp.
Norton Co.
Remmey, Richard C., Son Co.

Fire Brick—Process Equipment
Lancaster Iron Works, Inc.

Fire Clay
Great Lakes Foundry Sand Co.
Spinks, H. C., Clay Co.

Flint
Clinchfield Sand & Feldspar Corp.
Du Pont de Nemours, E. I., & Co., Inc.
Great Lakes Foundry Sand Co.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Maxson, Elwyn L.
Pemco Corp.

Flint Pebbles
Clinchfield Sand & Feldspar Corp.
Hommel, O., Co., Inc.
Maxson, Elwyn L.
Vitro Mfg. Co.

Flint (Soft decomposed Cararra)
Innis, Speiden & Co.

Floating Construction for Tunnel Kiln Cars
Electro Refractories and Alloys Corp.

Floors (Non-Slip)
Norton Co.

Fluorspar
Harshaw Chemical Co.
Hommel, O., Co., Inc.

French Flint
Maxson, Elwyn L.

Frit
Ferro Enamel Corp.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Maxson, Elwyn L.
Pemco Corp.
Titanium Alloy & Mfg. Co.
Vitro Mfg. Co.

Frosting Mixtures
Drakenfeld, B. F., & Co., Inc.
Harshaw Chemical Co.
Hommel, O., Co., Inc.

Fuel Oil Systems and Control Stokers
Frazier-Simplex, Inc.
Harrop Ceramic Service Co.

Furnaces
Carborundum Co. (*Carboradiant*)
Ferro Enamel Corp.
Frazier-Simplex, Inc.
Harrop Ceramic Service Co.
Hommel, O., Co., Inc.
Swindell-Dressler Corp.

Furnaces (Laboratory)
Remmey, Richard C., Son Co.

Furnaces, Enameling
Ferro Enamel Corp.
Swindell-Dressler Corp.

Gauges, Draft (Recording, Indicating)
Leeds & Northrup Co.

Gauges, Pressure
Leeds & Northrup Co.

Glass Bending Ovens, Glass Decorating Machines
Frazier-Simplex, Inc.

Glass Equipment (Batch Mixer)
Lancaster Iron Works, Inc.

Glass Furnace Refractories
Corhart Refractories Co.

Glass Melting Tanks and Furnaces
Frazier-Simplex, Inc.

Glass Sand
Great Lakes Foundry Sand Co.

Glass Thickness Gauge
Bausch & Lomb Optical Co.

Glaze and Body Spar
Clinchfield Sand & Feldspar Corp.
Du Pont de Nemours, E. I., & Co., Inc., Electrochemicals Dept.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Maxson, Elwyn L.
Pemco Corp.
Vitro Mfg. Co.

Glazes and Enamels
Drakenfeld, B. F., & Co., Inc.
Du Pont de Nemours, E. I., & Co., Inc., Electrochemicals Dept.
Ferro Enamel Corp.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Maxson, Elwyn L.
Pemco Corp.
Titanium Alloy & Mfg. Co.
Vitro Mfg. Co.

Glaze Spar
Clinchfield Sand & Feldspar Corp.
Du Pont de Nemours, E. I., & Co., Inc., Electrochemicals Dept.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Maxson, Elwyn L.

Goggles
Bausch & Lomb Optical Co.
Hommel, O., Co., Inc.

Gold
Drakenfeld, B. F., & Co., Inc.
Du Pont de Nemours, E. I., & Co., Inc., Electrochemicals Dept.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Vitro Mfg. Co.

Gold Decorations
Du Pont de Nemours, E. I., & Co., Inc., Electrochemicals Dept.
Harshaw Chemical Co.
Hommel, O., Co., Inc.

Granulators
Lancaster Iron Works, Inc.

Grinding Wheels
Carborundum Co. (*Carborundum and Aloxite*)
Electro Refractories & Alloys Corp.
Norton Co. (*Alundum-Crystolon*)

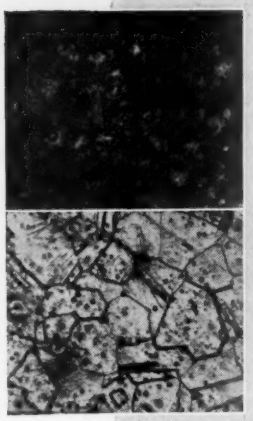
Gums: *Arabic*—Amber Sorts, Powdered Grained
Ghatti—Powdered, Granular, Crude
Locust Bean—Powdered
Tragacanth—Ribbon—Flake—Powdered
Innis, Speiden & Co.

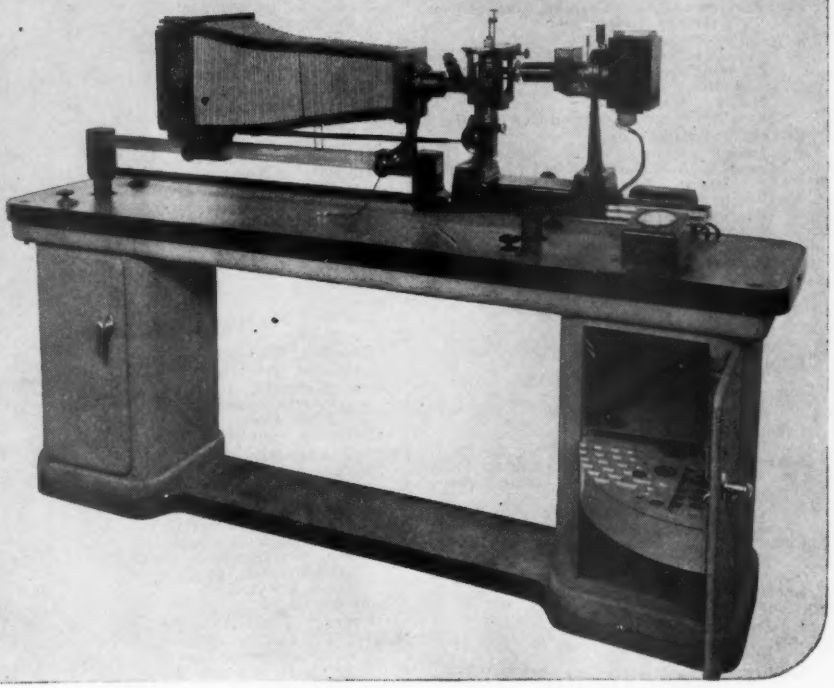
Hearths
Carborundum Co. (*Carbofrax* heat treating)
Corhart Refractories Co.
Norton Co. (*Crystolon*)
Remmey, Richard C., Son Co.

Hearths (High Aluminous Clay, Electrically Sintered Aluminum Oxide, Silicon Carbide)
Carborundum Co.
Norton Co.
Remmey, Richard C., Son Co.

Harshaw Research Laboratories located in Cleveland

TOOLS FOR *Ceramic* RESEARCH





HARSHAW

METALLOGRAPH *Speeds* CERAMIC RESEARCH

Harshaw research men rely upon the metallograph for clean-cut microphotographs of metal and ceramic sections. • The metallograph assists in the study of interfacial reactions—important for example in the bonding of porcelain enamel to metal; in the examination of pits, blisters, and similar defects; and in the determination of surface and crystalline change in a finished product produced by a modification of batch or processing. • The metallograph is useful in research, in control, and in backing up field service. Buy from Harshaw with confidence.

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BRANCHES IN PRINCIPAL CITIES

FRITS
CHEMICALS

High Temperature Mortars
Corhart Refractories Co.
Hoists, Portable Hand
Clipper Mfg. Co.
Hydrofluoric Acid
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Pennsylvania Salt Mfg. Co.
Ilmenite
Foote Mineral Co.
Orefraction, Inc.
Iron (Enameling)
American Rolling Mill Co.
Iron Oxide
Drakenfeld, B. F., & Co., Inc.
Du Pont de Nemours, E. I., & Co., Inc.
Foote Mineral Co.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Pemco Corp.
Vitro Mfg. Co.
Kaolin
Hammill & Gillespie, Inc.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Maxson, Elwyn L.
Vitro Mfg. Co.
Kiln Furniture (Silicon Carbide, Semi-Silicon Carbide) (Refractory)
Carborundum Co.
Electro Refractories & Alloys Corp.
Ferro Enamel Corp.—Ceramic Supply Div.
Maxson, Elwyn L.
Remmey, Richard C., Son Co.
Kilns, China (Decorating)
Drakenfeld, B. F., & Co., Inc.
Ferro Enamel Corp.—Allied Engineering Div.
Frazier-Simplex, Inc.
Harrop Ceramic Service Co.
Hommel, O., Co., Inc.
Swindell-Dressler Corp.
Kilns (Electric, Circular, Tunnel)
Ferro Enamel Corp.—Allied Engineering Div.
Harrop Ceramic Service Co.
Maxson, Elwyn L.
Swindell-Dressler Corp.
Kilns (Laboratory)
Remmey, Richard C., Son Co.
Kryolith (see Cryolite)
Pennsylvania Salt Mfg. Co.
Laboratory Ware
Norton Co.
Lehr Tile (High Aluminous Clay, Electrically Sintered Aluminum Oxide, Silicon Carbide)
Carborundum Co.
Electro Refractories & Alloys Corp.
Lehrs
Frazier-Simplex, Inc.
Swindell-Dressler Corp.
Lehrs (Electric or Fuel Heated)
Frazier-Simplex, Inc.
Swindell-Dressler Corp.
Lehr Loaders
Frazier-Simplex, Inc.
Linings (Furnace Refractory, Block Refractory Plate, Brick, and Tile)
Carborundum Co.
Corhart Refractories Co.
Electro Refractories & Alloys Corp.
Maxson, Elwyn L.
Norton Co.
Remmey, Richard C., Son Co.
Vitro Mfg. Co.
Lithium Carbonate
Drakenfeld, B. F., & Co., Inc.
Foote Mineral Co.
Hommel, O., Co., Inc.
Metalloy Corp.
Lithium Flouride
Metalloy Corp.
Lithium Minerals
Foote Mineral Co.
Metalloy Corp.
Magnesia (Fused)
Electro Refractories & Alloys Corp.
Norton Co.
Magnesia (Sintered, Calcined)
Drakenfeld, B. F., & Co., Inc.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Pemco Corp.
Magnesite
Drakenfeld, B. F., & Co., Inc.
Du Pont de Nemours, E. I., & Co., Inc.
Foote Mineral Co.
Hammill & Gillespie, Inc.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Vitro Mfg. Co.
Magnesite Calcined
Foote Mineral Co.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Magnesium Carbonate
Drakenfeld, B. F., & Co., Inc.
Ferro Enamel Corp.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Manganese Dioxide
Drakenfeld, B. F., & Co.
Ferro Enamel Corp.
Foote Mineral Co.
Hammill & Gillespie, Inc.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Vitro Mfg. Co.
Manganese (Oxide)
Corhart Refractories Co.
Drakenfeld, B. F., & Co., Inc.
Ferro Enamel Corp.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Masks (Breathing)
Drakenfeld, B. F., & Co., Inc.
Hommel, O., Co., Inc.
Metals (Porcelain Enameling)
American Rolling Mill Co.
Micronized Products
Pemco Corp.
Microscope, Laboratory
Bausch & Lomb Optical Co.
Microscopes (Polarizing)
Bausch & Lomb Optical Co.
Harshaw Chemical Co.
Spencer Lens Co.
Microscopes (Stereoscopic)
Bausch & Lomb Optical Co.
Harshaw Chemical Co.
Spencer Lens Co.
Minerals
Clinchfield Sand & Feldspar Corp.
Drakenfeld, B. F., & Co., Inc.
Du Pont de Nemours, E. I., & Co., Inc., Electrochemicals Dept.
Foote Mineral Co.
Hammill & Gillespie, Inc.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Orefraction, Inc.
Vitro Mfg. Co.
Mixers
Clearfield Machine Co.
Mixers (Batch)
Clearfield Machine Co.
Lancaster Iron Works, Inc.
Mixers (Concrete, Paving, Road Paving, Plaster, Asphalt, Truck, Mortar, Bituminous)
Lancaster Iron Works, Inc.
Mixers (Laboratory)
Lancaster Iron Works, Inc.
Mold Sanders
Lancaster Iron Works, Inc.
Muffles (Furnace) (Laboratory)
Carborundum Co. (*Carbofrax*)
Electro Refractories & Alloys Corp.
Frazier-Simplex, Inc.
Maxson, Elwyn L.
Norton Co.
Remmey, Richard C., Son Co.
Mullers (Batch)
Clearfield Machine Co.
Lancaster Iron Works, Inc.
Mullite Refractories
Corhart Refractories Co.
Remmey, Richard C., Son Co.
Muriatic Acid
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Pennsylvania Salt Mfg. Co.
Needle Antimony
Foote Mineral Co.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Nepheline Syenite
Great Lakes Foundry Sand Co.
Maxson, Elwyn L.
Nickel Salts
Drakenfeld, B. F., & Co., Inc.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Nitrates (Cobalt, Sodium)
Drakenfeld, B. F., & Co., Inc.
Du Pont de Nemours, E. I., & Co., Inc.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Vitro Mfg. Co.
Nitre
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Norbide (Norton Boron Carbide)
Norton Co.
Olivine
Clinchfield Sand & Feldspar Corp.
Du Pont de Nemours, E. I., & Co., Inc., Electrochemicals Dept.
Opacifiers
Drakenfeld, B. F., & Co., Inc.
Du Pont de Nemours, E. I., & Co., Inc., Electrochemicals Dept.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Maxson, Elwyn L.
Metal & Thermit Corp.
Pemco Corp.
Pennsylvania Salt Mfg. Co.
Titanium Alloy & Mfg. Co.
Vitro Mfg. Co.
Overglaze Colors
Drakenfeld, B. F., & Co., Inc.
Du Pont de Nemours, E. I., & Co., Inc., Electrochemicals Dept.
Ferro Enamel Corp.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Maxson, Elwyn L.
Oxides
Drakenfeld, B. F., & Co., Inc.
Du Pont de Nemours, E. I., & Co., Inc., Electrochemicals Dept.
Ferro Enamel Corp.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Maxson, Elwyn L.
Metal & Thermit Corp.
Pemco Corp.
Titanium Alloy & Mfg. Co.
Vitro Mfg. Co.
Palladium Decorations
Du Pont de Nemours, E. I., & Co., Inc., Electrochemicals Dept.
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Clearfield Machine Co.
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Hommel, O., Co., Inc.
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Potters Supply Co.
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Great Lakes Foundry Sand Co.
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Hommel, O., Co., Inc.
Polariscopes
Frazier-Simplex, Inc.
Porcelain Enameling Service (Practical)
American Rolling Mill Co.
Du Pont de Nemours, E. I., & Co., Inc., Electrochemicals Dept.
Ferro Enamel Corp.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Pemco Corp.
Titanium Alloy & Mfg. Co.
Vitro Mfg. Co.
Porcelain Enamels
Ferro Enamel Corp.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Pemco Corp.
Titanium Alloy & Mfg. Co.
Vitro Mfg. Co.
Potash (Carbonate)
Du Pont de Nemours, E. I., & Co., Inc.
Harshaw Chemical Co.
Hommel, O., Co., Inc.
Innis, Speiden & Co
Solvay Sales Corp.
Vitro Mfg. Co.
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Innis, Speiden & Co.
Solvay Sales Corp.
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Pug Mills
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Harshaw Chemical Co.
Hommel, O., Co., Inc.
Pyrometer Tubes
Carborundum Co.
Leeds & Northrup Co.
Maxson, Elwyn L.
Montgomery Porcelain Products Co.
Pyrometer Tubes (Refractory and Hard Porcelain)
Electro Refractories & Alloys Corp.
McDanel Refractory Porcelain Co.
Montgomery Porcelain Products Co.
Norton Co.
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Leeds & Northrup Co.
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Du Pont, de Nemours, E. I., & Co., Inc.
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Maxson, Elwyn L.
Pyrophyllite
Clinchfield Sand & Feldspar Corp.
Du Pont de Nemours, E. I., & Co., Inc., Electrochemicals Dept.
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That is why 8 out of 10 enameling-furnace piers are constructed of B&W 80's . . . conclusive evidence of their superiority . . . a fact well worth remembering when ordering firebrick replacements.

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Norton Co.
Remmey, Richard C., Son Co.
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Hommel, O., Co., Inc.
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Harshaw Chemical Co.
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McDanel Refractory Porcelain Co.
Norton Co.
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Leeds & Northrup Co.
Maxson, Elwyn L.
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Norton Co.
Ultrox
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Ferro Enamel Corp.
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Hommel, O., Co., Inc.
Uranium Oxide (Yellow-Orange-Black)
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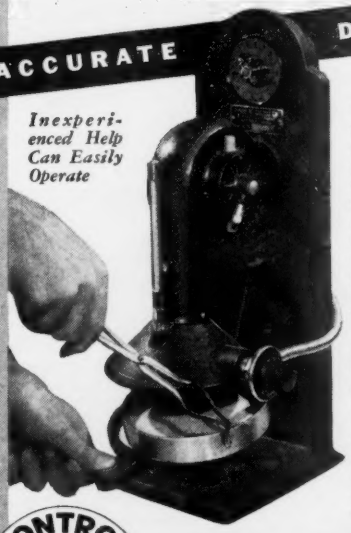
Determine Moisture Content Within a FEW MINUTES

ACCURATE DEPENDABLE

Inexperienced Help Can Easily Operate



The Dietert Moisture Teller is being used in Ceramic plants and laboratories as a time and money saver. Moisture content is determined accurately and rapidly, by forcing electrically heated air through the test sample of clay, grog, frit, sand, dry enamel, graphite, fire clay, dolomite and other granular materials. Test is in exact moisture percentage by gravimetric method and no corrections or calibrations are required. Write today.

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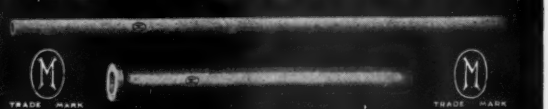
Primary Protection Tubes for all makes of Pyrometers

MONTGOMERY



PYROMETER TUBES

★ MULLITE

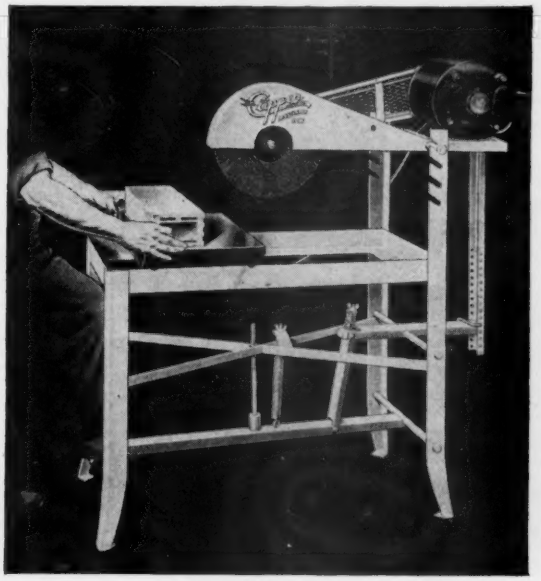
★ REFRACTORY PORCELAIN

MONTGOMERY PORCELAIN PRODUCTS CO.

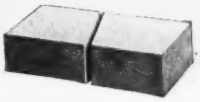
FRANKLIN OHIO

FASTER CUTTING...with Clipper Masonry Saws

Your Special Size and Shape Brick or Tile can now be "Tailor-Made" at a moment's notice!

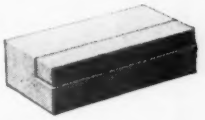


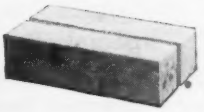
The new Clipper Multiple Cutting Principle makes possible faster cutting of every masonry material regardless of hardness. Here are a few typical examples:



This acid brick intended for a chemical plant acid chamber was cut completely in two, in just 37 seconds.

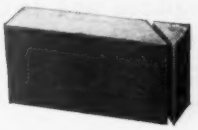
One of many intricate cuts performed on first quality clay brick for heat treating furnaces. Made in 8 sec.





Silica brick cut lengthwise for open hearth furnace work, only 9 seconds were required to complete this cut!

Basic refractories for steel furnaces or cement kilns must be accurately installed. This magnesite brick was cut in 12 seconds.



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THE Clipper "SAWS RIGHT THRU" MANUFACTURING COMPANY

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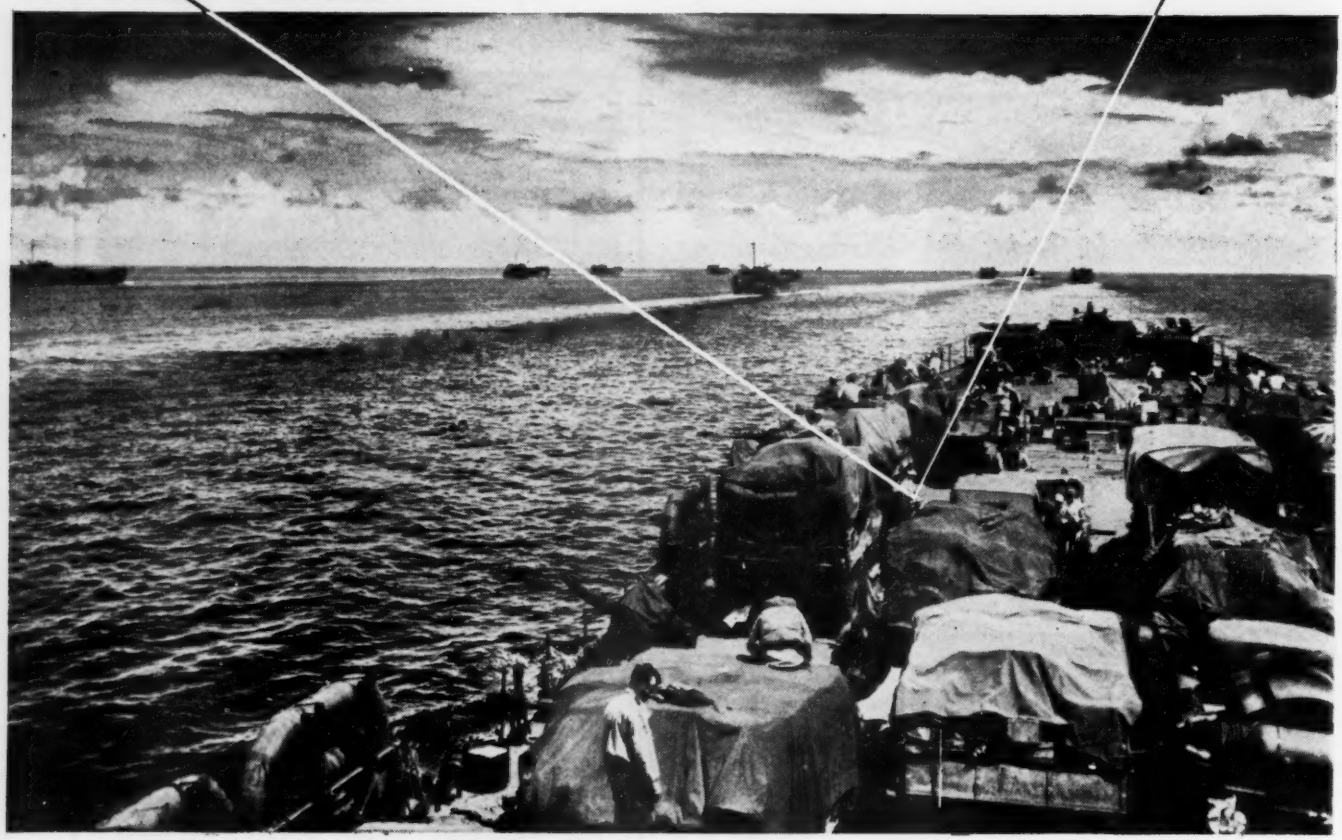

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Today the veterans of our European victories are sailing to final triumph in the Pacific! Meanwhile patriotic American industrial leaders are following a full-speed-ahead program to hasten peace through the Payroll Savings Plan!

From coast to coast, veteran Bond salesmen—and women—who put over the Mighty 7th, are once more mustered into service for plantwide selective resolicitation campaigns. These special efforts to keep employee Bond buying at a maximum are directed toward two major objectives:

A To hold every new 7th War Loan subscriber on the Payroll Savings Plan books—maintaining and, wherever possible, increasing present Bond allotments.

B To convince all regular subscribers who recently stepped up their Bond buying, of the many advantages of continuing on this foresighted, extra-Bonds-for-the-future basis.

Back up our fighting men who have won one war—and will win another. Use selective resolicitation to make your Payroll Savings Plan more effective—put a tighter rein on inflationary tendencies—build peacetime prosperity.

The Treasury Department acknowledges with appreciation the publication of this message by

THE AMERICAN CERAMIC SOCIETY, INC.

★ *This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and War Advertising Council* ★

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BORAX *Guaranteed 99½%–100% Pure* BORIC ACID

Select the Brand which has back of it years of *successful use* by experienced Ceramists

Pacific Coast Borax Co., New York

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WANTED—CERAMIC ENGINEERS

Age 22–35 for either Production or Technical work on Refractories. Eastern location. Permanent employment with progressive well-known company. Better than-usual opportunities. Submit experience outline with small photograph. State salary. Reply Box 287F, American Ceramic Society, 2525 N. High St., Columbus 2, Ohio.

All Types of Circular and Straight Tunnel Kilns

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Post Office Box 1888 **Pittsburgh. Pa.**

Lehrs and Enameling Furnaces, Electric and Gas Fired

Full Details Furnished on Request

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The Membership Roster contains the names and addresses of all paid members of the Society corrected to September. It is referred to frequently by every member. Your advertising message will reach a selected and receptive audience—it will reach the important men in the industry.

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	Number of Insertions			
	1	3	6	12
Full page.....	$80.00	$70.00	$60.00	$50.00
Half page.....	45.00	40.00	35.00	30.00
Quarter page....	24.00	22.00	20.00	18.00
Eighth page...	13.00	12.00	11.00	10.00

Color rates on application

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USE ORTON

Standard Pyrometric Cones

"The accepted standard for nearly a half century"

For

Simple, Accurate, Dependable and Low Cost Control of Kiln Firing

1. ORTON STANDARD PYROMETRIC CONES may be used either as a primary or secondary control device to INSURE the production of a high percentage of A-1 Quality Ware from either periodic or tunnel kilns.

2. ORTON STANDARD PYROMETRIC CONES may be used to control,
   —the correct end point of firing.
   —the uniform distribution of heat and the rate of heat advance throughout the ware setting above a dull red heat.

3. ORTON (de-aired Machine Made) STANDARD PYROMETRIC CONES are accurate because they are uniform in composition, structure, and thermal behavior.

The Edward Orton, Jr., Ceramic Foundation

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Fans and Blowers for the Ceramic Industry

Turbine Type Pressure Blowers	**Recirculating Fans**
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Place your air handling problems in our hands . . . Our 50 years' experience assures efficient results.

ROBINSON VENTILATING COMPANY
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CERAMIC ENGINEER

Thoroughly experienced, who can set up kilns, train help, establish formulas, and take active supervision of fine ceramic figurine plant in New England. Replies in confidence. Address Box 288F, The American Ceramic Society, 2525 N. High St., Columbus 2, Ohio.

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Lining of pump housings and coatings of impellers.
Mammoth Porcelain Lined Chemical Tanks.
Stills and Mixers used in the chemical industry.
Exhaust Manifolds.
Meter Bases.
Insulators.
Electrical Outlet Boxes.
Protective coating on working parts of various mechanical devices.
Enameled Housings for mechanisms.

Such applications demand Porcelain Enamel Fri with the correct coefficient to thermal expansion—extreme resistance to abrasion—resistance to high temperatures—resistance to organic and mineral acids—special finishes—liberal firing range—elasticity. . . . all to be found in a Hommel Frit.

Consult Hommel Service Engineers for suggestions from Designing to Plant Production. They roll up their sleeves and go to work on your problem. **Write or wire today.**

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World's Most Complete Ceramic Supplier

Ceramic Service? We Give It

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Pins—all shapes and lengths
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Thimbles
Spurs
Saggers—Bisque ovals only
Crucibles
Modeling Clay

We Sell—

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EAST LIVERPOOL, OHIO

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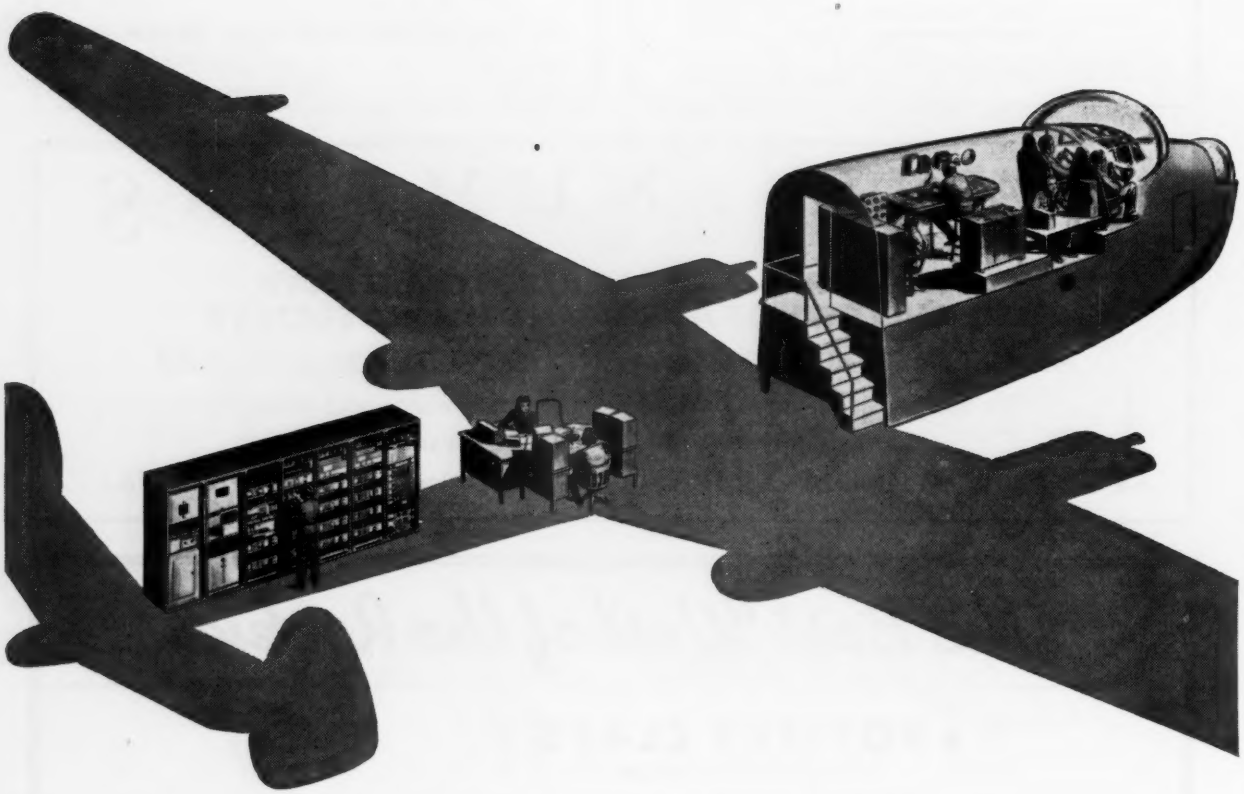

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